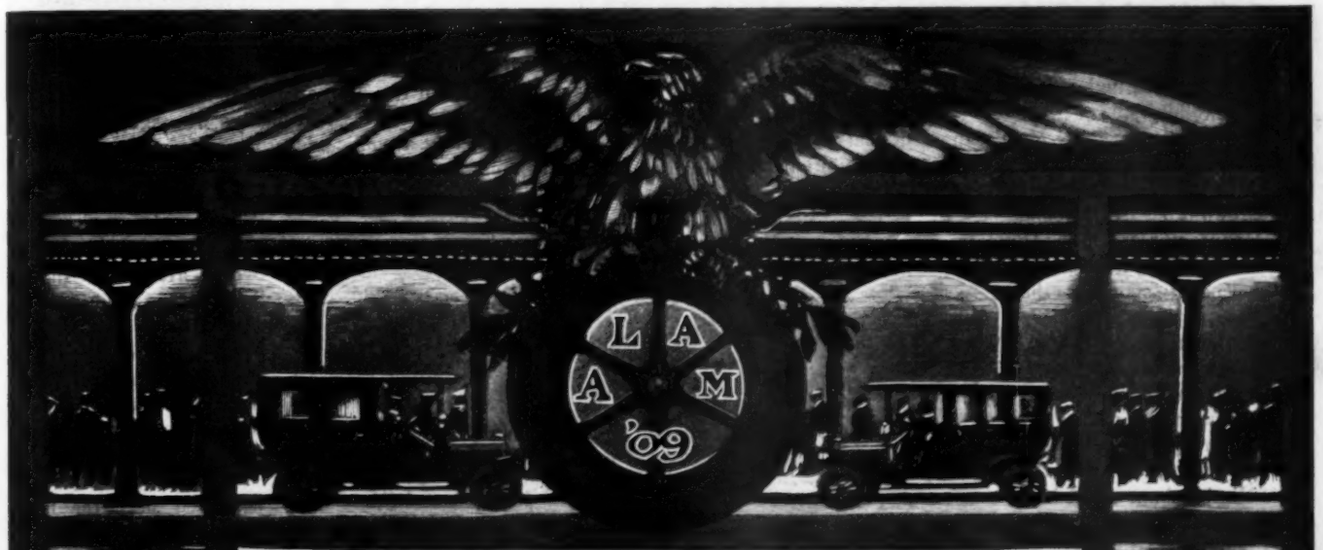
VOL. XX NEW YORK—THURSDAY, JANUARY 14, 1909—CHICAGO No. 2

THE AUTOMOBILE



THERE is no way of getting around it: The best place in which to hold an automobile show in this country is in Madison Square Garden, that famous structure which has housed so many different affairs, conducted partly for the metropolitan public, but in reality for everybody, since nearly everybody who can comes to New York some time during the year. And a good many of them nowadays come at the time of the automobile show. It supplies a good excuse for visiting the "Big Town."

Prestige is possessed by the "Garden" as against any other building, and there is a homelike feeling which comes when one enters the portals on Madison avenue and begins to wend his way into the big amphitheater after a preliminary peep into the restaurant which isn't a restaurant during show time.

Something quite out of the usual run has been promised for the "Ninth National Automobile Show" under the auspices of the Association of Licensed Automobile Manufacturers, opening on Saturday night next, with prophecies that more automobilists will be made during the eight days and nights than ever before were produced by a "Garden" show.

While the first automobile made its appearance in the Garden during the concluding appearance of the bicycles, it was not until the following year that a so-called automobile show was held, this being the effort of the Automobile Club of America, which was more or less of a loan exhibition, members in many instances

loaning their cars, and the grand total of exhibitors, including accessory manufacturers, being sixty in number.

Incidentally, it should be mentioned that Secretary James C. Young had a good deal to do with the promoting of this show; in fact, if it had not been for his successful talk with Frank W. Sanger, who died several years ago, there would not have been any beginning in the Garden at all, at least not at that time. The show of December, 1901, also had a substantial loan account, with 93 actual exhibitors and none from abroad. Next came the display of January, 1903, with the National Association of Automobile Manufacturers promoting the show in conjunction with the A. C. A. and the Garden management. The list of exhibitors totaled 150, and the first foreign exhibitor was the Paris Automobile Company, represented by Henry Fournier. In 1904 under the same management there were over 200 exhibitors.

A year later it was plainly apparent that no one building could house the industry properly for exhibition purposes. Hence the 1906 show was that of the Association of Licensed Automobile Manufacturers, while the A. C. A. held an independent show at the same time in an armory not far away. Since then each year the A. L. A. M. show has continued to demonstrate progress and prosperity, and what is designated as the "Ninth Annual" bids fair to excel all of its predecessors.

'Tis promised that the decorative features will be artistically satisfying, with exhibits placed without undue crowding, and the comfort of those who attend well considered in the general conduct of the exhibition.

The Famous Firm of George B. Selden and Son.

This year the color scheme of the show is brown and white, with green carpet on the floor of the exhibition spaces. By the use of the decorative lamp-posts bearing the names of the exhibitors, and the manner in which the entrance way will be treated, it will be possible to get a comprehensive view of the whole main floor, the exhibits being represented panoramically. Mirrors at certain points deepen the perspective. The A. L. A. M. "Old Abe" emblem will be conspicuous—an eagle with outspread wings perched on an automobile wheel.

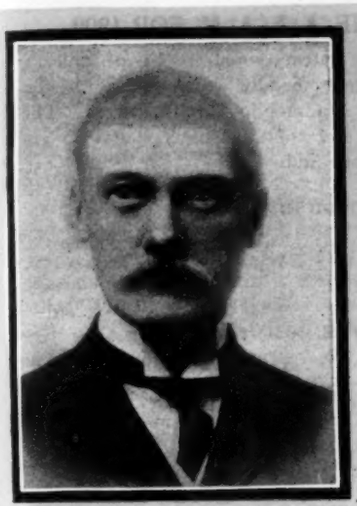
A triumphal arch, 87 by 48 feet, at the rear of the Garden, will be the *piece de resistance* of the decorative scheme. It is the most massive and ambitious piece of ornamentation ever undertaken for an indoor exhibition.

This year the show is one of American-built cars only—truly a national event.

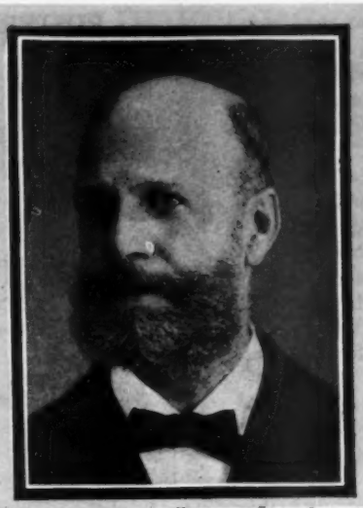
In the date fixed for the ninth show there is a tacit recognition by the makers of the changed character and new commercial value of automobile shows. The previous show in the Garden was held during the first week in November, and the present exhibition marks the second time that the show date has been moved along from the Fall to January. It is now accepted that the show is for the public, the individual enthusiast, the buyer and user, although it is still conducted by the manufacturers and not by the retailers. "This is the essential difference," states the press agent, "between the two national shows in New York and Chicago, and those of Boston, Philadelphia, and elsewhere. In former years it was considered that the show was a trade event, one arranged by the manufacturers for the dealer. Then the dealers waited till show time before making their commitments as to the exact cars they would handle during the ensuing year. At the show the manufacturer expected to book his agents and close his contracts with them for the number of cars they would handle. The business done direct with users was deemed of secondary consequence. This condition was largely a theory always. It was more or less a fact during the first two or three shows, but the January date was too late for agents. They began to close their deals with the manufacturers early in the Fall, and by show time most of the big makers had no interest in making new agents, and the show was merely a public educator and stimulus, at which a fair amount of retail orders were booked. Still, the theory held that the manufacturers ran the shows for the benefit of agents, and its influence was noticed when, after two shows in the Fall and five in January, the eighth show was set back to the 1st of November. The result demonstrated that the show is now an exposition for the public."

In view of all that has happened since the first real exhibition in the Garden, it might be interesting to read again the list of those who participated. Here they are:

Electric Vehicle Co., Riker Vehicle Co., Locomobile Company of America, National Automobile & Electric Co., De Dion-Bouton Motorette Co., Waltham Mfg. Co., American Bicycle Co., Winton Motor Carriage Co., Mobile Company of America, Baker Motor Vehicle Co., Autocar Co., Foster Automobile Manufacturing Co., Automobile Company of America, Woods Motor Vehicle Co., Stanley Manufacturing Co., Canda Manufacturing Co., Buffalo Electric Carriage Co., Daimler Manufacturing Co., Holyoke Automobile Co., Knox Automobile Co., Overman Automobile Co., International Motor Carriage Co., Trinity Cycle Manufacturing Co., John T. Robinson & Co., Peerless Manufacturing Co., Springfield Cornice Works, St. Louis Motor Carriage Co., Haynes-Apperson Co., Strong & Rogers, Duryea Motor Co., Upton Machine Co., Automobile Club of America, Edmond Motor Cycle Co., New York Motor Vehicle Co., Munger Vehicle Tire Co., Steam Vehicle Co., Badger Brass Manufacturing Co., Bevin Brothers Manufacturing Co., E. A. Brecher & Co., Consolidated Rubber Tire Co., Crest Manufacturing Co., Diamond Rubber Co., Dixon Crucible Co., Downing & Co., Dow Portable Electric Assistant Co., Gleason Peters Air Pump Co., B. F. Goodrich & Co., Goodyear Tire & Rubber Co., Gray & Davis, Hartford Rubber Works Co., Janney, Steinmetz & Co., Metallic Rubber Tire Co., Charles E. Miller, New Process Rawhide Co., New York Belting & Packing Co., Pennsylvania Automobile & Gear Co., C. F. Splitdorf, Veeder Manufacturing Co., and Ware Brothers.



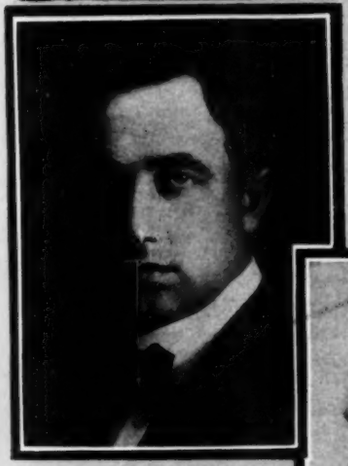
Charles Clifton - President A.L.A.M.



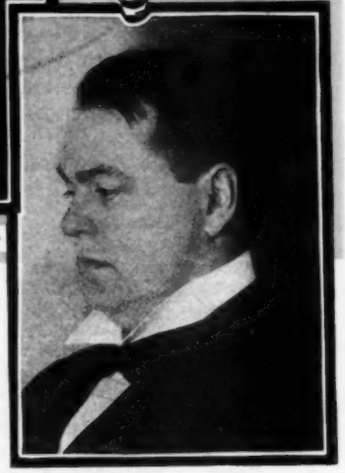
Col. George Pope - Chairman Show Committee

E. P. Chalfant - General Manager A.L.A.M.

The Show Committee of the A. L. A. M.



M. L. Downs - Secretary



Coker F. Clarkson - A. L. A. M. Publicity.

NATURALLY the first thing to do in order to conduct successfully an automobile exhibition is to get a show committee. Experience counts for much in affairs of this kind where innumerable details require prompt and skilful attention, or otherwise an avalanche of little things accumulates and sadly interferes with the perfect lubrication so essential in satisfying first the exhibitors and ultimately the public itself.

In the contingent which has direct charge of the "Ninth National Automobile Show" in Madison Square Garden are men well qualified for the work and who have demonstrated the fact on previous occasions. The A. L. A. M. only requires four members for its committee, including President Charles Clifton, ex-officio. There is one new face on the committee this year and a second new one prominent in connection with the show work. The new member of the committee is E. P. Chalfant, the new general manager of the Association of Licensed Automobile Manufacturers, and the new man associated with the committee work is Coker F. Clarkson, the new head of the A. L. A. M. publicity department. The others of the committee are the same as last year: Col. George Pope, chairman; Charles Clifton, and M. L. Downs, secretary.

To the ability of these men is due the success and magnificence of the "Garden" show. Charles Clifton is as prominent a figure as any in the industry, he being treasurer of the George N. Pierce Company and president of the Association of Licensed Automobile Manufacturers, with all the affiliations and activities those positions imply.

Col. George Pope is a landmark in the industry, having been for years the treasurer of the Pope Manufacturing Company. He has been chairman of the A. L. A. M. show committee for three successive years.

Edward P. Chalfant has been identified with the automobile industry since January 1, 1905, although he was previously in the tire business. He was sales manager and a director of the Waltham Manufacturing Company until he was called to the post of general manager of the A. L. A. M.

M. L. Downs, secretary of the committee, has been identified with the automobile industry since its inception and has been in every branch of it, even to managing some big runs. For the last five years he has been with the A. L. A. M. and has attended to the detail work in connection with all the licensed shows.

Coker F. Clarkson, the new head of the A. L. A. M. publicity department, is a lawyer who found a greater interest in engineering matters, and from electrical experimenting he stepped into the A. L. A. M. as secretary of its mechanical branch, which post he retains with his new one. Mr. Clarkson in his younger days did newspaper work. He is a former president of the Y. M. C. A. Motor Club, being a graduate of the first Y. M. C. A. motor class. He is the compiler of the A. L. A. M. mechanical digests and handbooks, and the general statistician of the association.

In speaking of the preparations for the show, Col. George Pope, chairman, tells of the work in these words:

"In the preliminary stages of the show preparation, engineers measure up the building to make use of all available area for exhibition purposes, considering the comfort and safety of the public as to passageways and regular and emergency exits.

"Then the architect studies the building, to get from artistic standpoints an harmonious decorative scheme, in keeping with the floor plans of the engineers; lending itself to the practical side of a trade exhibition.

"Then follow the constructing builders, to overhaul the building, to bring about the required result. Then the work of preparation divides itself into two great divisions, one of which involves almost endless communications with the trade regarding space, the preparation of thoroughly indexed rules for the conduct of the show, just to the large and small exhibitors and the management.

"Above all, a high standard is maintained. Exhibits which could reasonably be considered freakish or of negligible interest, or irrelevant to the needs of the motorist, are prohibited."

M. L. Downs, secretary of the show committee, calls attention to the pessimism which existed in the early days of the automobile and how many people regarded the first exhibition which took place in the Garden. While they looked at the meager supply of cars they expressed the belief that the "fad" would not last as long as the bicycle, but they could not foresee the marvelous advances in manufacturing methods. Here is what Mr. Downs says:

"In the early days when automobiles were first struggling for recognition in this country, one of the pioneer companies took a small space in a corner of a bicycle exhibition and showed two cars therein. They excited a great deal of curiosity, yet at the same time were laughed at by the majority of the public as being impractical and simply a dream and toy of the rich that never would be of any use for ordinary purposes.

"Not many years have rolled by since that day, and many of the scoffers of that period are now enthusiastic automobilists.

"Instead of the man dressed in sweater and knee-breeches, bending low over the handle-bar of his bicycle, working hard for every foot of ground that he covers, we now find him taking his ease, sitting in a luxuriously upholstered car, going here and there at will, covering long distances that in bicycle days were looked upon as impossible. The automobile has made possible the pleasures of a country home, with all that it means, and yet allows a man to conduct his business in the city."

In the running of a show it is always a mighty good plan to have a good press agent, and here's a sample of what A. N. Jervis recently supplied in the way of word painting:

"The hoisting of the circus tent and installation of the animals, to watch which the small boy plays hookey from school, is no more interesting to him than would be to an adult a similar exhibition of complicated activity in the work of preparation that is now in progress at Madison Square Garden. The annual automobile show, which opens at the Garden next Saturday night, has come to be the particular event for which the big amphitheater is most elaborately decorated and generally transformed. The show managers of the Association of Licensed Automobile Manufacturers are now in possession of the Garden, and the carpenters, decorators, electricians and painters, with their assistants, to the number of ten score, are overrunning the place from cellar to rafters, all as busy as sailors getting a ship under way. At first glance it looks like a terribly confused activity, but a little observation shows organization in half a dozen different directions and orderly coherent co-operation that will quickly bring the scheme to completeness and beauty. The show is to have more exhibitors than ever this time, about 325, and the wits of the planners have been taxed to provide for them, but it will all seem to have been easily done when the big crowd surges in on the opening night."

ROSTER OF THE A. L. A. M. FOR 1909.

Herewith is given the latest complete list of officers, committeemen and others officially connected with the Association of Licensed Automobile Manufacturers. The list is a formidable one and contains many men who are pioneers of the automobile industry:

OFFICERS

Charles Clifton, President.....The George N. Pierce Co.
Thomas Henderson, Vice-Pres...Winton Motor Carriage Co.
L. H. Kittredge, Secretary.....Peerless Motor Car Co.
George Pope, Treasurer.....Pope Manufacturing Co.

EXECUTIVE COMMITTEE

Charles Clifton.....The George N. Pierce Co.
S. T. Davis, Jr.....Locomobile Company of America
Thomas Henderson.....Winton Motor Carriage Co.
G. H. Stillwell.....H. H. Franklin Manufacturing Co.
Herbert Lloyd.....Electric Vehicle Co.

TRADES COMMITTEE

W. E. Metzger.....Everitt-Metzger-Flanders Co.
George Pope.....Pope Manufacturing Co.
H. H. Franklin.....H. H. Franklin Manufacturing Co.
C. C. Hildebrand.....Stevens-Duryea Co.
Thomas Henderson.....Winton Motor Carriage Co.

COMMITTEE ON FIRES

Albert L. Pope.....Pope Manufacturing Co.
L. H. Kittredge.....Peerless Motor Car Co.
S. D. Waldon.....Packard Motor Car Co.
M. J. Budlong.....Packard Motor Car Co.
R. D. Chapin.....Chalmers-Detroit Motor Co.

HAND BOOK COMMITTEE

L. H. Kittredge.....Peerless Motor Car Co.
W. E. Metzger.....Everitt-Metzger-Flanders Co.
Thomas Henderson.....Winton Motor Carriage Co.

SHOW COMMITTEE

George Pope.....Pope Manufacturing Co.
Charles Clifton.....The George N. Pierce Co.
E. P. Chalfant.....A. L. A. M.
M. L. Downs, Secretary.....A. L. A. M.

ADVERTISING AND PUBLICITY COMMITTEE

E. R. Thomas.....E. R. Thomas Motor Co.
Charles B. Shanks.....F. B. Stearns Co.
J. A. Kingman.....Locomobile Company of America

NEW YORK OFFICE

E. P. Chalfant.....General Manager

PATENT DEPARTMENT

Hermann F. Cuntz.....Manager

ADVERTISING AND PUBLICITY DEPARTMENT

Coker F. Clarkson.....Manager

ASSOCIATION PATENTS COMPANY

Charles Clifton, President.....The George N. Pierce Co.
Thomas Henderson, Vice-Pres...Winton Motor Carriage Co.
J. H. Becker.....Elmore Manufacturing Co.
George Pope.....Pope Manufacturing Co.
I. H. Page.....Stevens-Duryea Co.
W. C. Leland.....Cadillac Motor Car Co.
M. S. Hart.....Corbin Motor Vehicle Corporation
E. P. Chalfant, Secretary and Treasurer.....A. L. A. M.

COMMITTEE ON TESTS

H. E. Coffin, Chairman.....Chalmers-Detroit Motor Co.
A. L. Riker.....Locomobile Company of America
H. P. Maxim.....Electric Vehicle Co.
John Wilkinson.....H. H. Franklin Manufacturing Co.
Russell Huff.....Packard Motor Car Co.
F. B. Stearns.....F. B. Stearns Co.
Charles Schmidt.....Peerless Motor Car Co.
David Fergusson.....The George N. Pierce Co.
Henry Souther .....Metallurgist
Coker F. Clarkson, Secretary.....A. L. A. M.

The A. L. A. M. has headquarters at No. 7 East Forty-second street, where the regular monthly meetings of the association are always held. Messrs. Chalfant, Downs, Clarkson and Cuntz are invariably in attendance at the New York offices.

WHERE THE EXHIBITORS ARE LOCATED

VISITORS to the Garden show will be most agreeably surprised at the neat, clean layout and distribution of exhibitors, which is in marked contrast with some previous exhibitions. The distribution is such as to give the impression of a vast space not uncomfortably filled with cars, thus allowing plenty of room for visitors. This is so cleverly done that in reality the effective floor space is very little less than last year. The tables below will show where the exhibits may be found in which the following key will be found useful. The letters in every case are an abbreviation of the words: M.F., Main Floor; E.P., Elevated Platform; E.H., Exhibition Hall; B., Basement; Bal., Balcony; S.T.B., Second Tier Boxes; T.T.B., Third Tier Boxes. The very small number of exhibitors upon the main floor, namely, twenty-three, will be noted as bearing out the idea of plenty of floor space.

GASOLINE PLEASURE CARS.

APPERSON: Apperson Bros. Auto Co., Kokomo, Ind. E.P. 32
AUTOCAR: Autocar Company, Ardmore, Pa. M.F. 7
CADILLAC: Cadillac Motor Car Co., Detroit. M.F. 4
CHALMERS-DETROIT: Chal.-Det. M. Co., Detroit. M.F. 17
COLUMBIA: Electric Vehicle Co., Hartford, Conn. M.F. 12
CORBIN: Corbin Motor Veh. Corp., New Britain, Ct. M.F. 9
ELMORE: Elmore Manufacturing Co., Clyde, O. M.F. 3
E-M-F: Everitt-Metzger-Flanders Co., Detroit. M.F. 8
FRANKLIN: H. H. Franklin Mfg. Co., Syracuse, N. Y. M.F. 18
HAYNES: Haynes Automobile Co., Kokomo, Ind. E.P. 25
HEWITT: Hewitt Motor Co., New York City. E.P. 27
KNOX: Knox Automobile Co., Springfield, Mass. M.F. 1
LOCOMOBILE: Loco. Co. of America, Bridgeport, Ct. M.F. 19
LOZIER: Lozier Motor Co., Plattsburg, N. Y. M.F. 11
MATHESON: Matheson Motor Car Co., Wilkes-Barre M.F. 2
PACKARD: Packard Motor Car Co., Detroit. M.F. 14
PEERLESS: Peerless Motor Car Co., Cleveland. M.F. 23
PIERCE: George N. Pierce Co., Buffalo, N. Y. M.F. 15
POPE-HARTFORD: Pope Mfg. Co., Hartford, Conn. M.F. 20
POPE-TOLEDO: Pope Motor Car Co., Hartford, Conn. M.F. 5
P. & S.: Palmer & Singer Mfg. Co., New York City. E.P. 27
ROYAL TOURIST: Royal Tourist Car Co., Cleveland. M.F. 6
SELDEN: Selden Motor Veh. Co., Rochester, N. Y. E.P. 24
SIMPLEX: Simplex Auto Co., New York City. E.P. 26
STEARNS: F. B. Stearns Co., Cleveland. M.F. 13
STEVENS-DURYEA: S.-D. Co., Chicopee Falls, Mass. M.F. 22
STUDEBAKER: Studebaker Auto Co., South Bend. M.F. 10
THOMAS: E. R. Thomas Motor Co., Buffalo, N. Y. M.F. 16
WALTER: Walter Automobile Co., Trenton, N. J. E.P. 28
WINTON: Winton Motor Carriage Co., Cleveland. M.F. 21

ELECTRIC PLEASURE CARS

BABCOCK: Babcock Electric Co., Buffalo, N. Y. E.H. 55
BAILEY: S. R. Bailey & Co., Amesbury, Mass. E.H. 53
BAKER: Baker Motor Vehicle Co., Cleveland. E.H. 57
COLUMBIA: Electric Vehicle Co., Hartford, Conn. E.H. 51
DETROIT: Anderson Carriage Co., Detroit. E.H. 54
RAUCH & LANG: R. & L. Car'ge Co., Cleveland. E.H. 52
STUDEBAKER: Studebaker Auto Co., South Bend. E.H. 56
WAVERLEY: The Waverley Co., Indianapolis, Ind. E.H. 50
WOODS: Woods Motor Vehicle Co., Chicago. E.P. 29

MAGNETOS AND TIMERS.

Atwater-Kent Mfg. Works, Philadelphia. E.P. 117
Apple Electric Co., Dayton, O. Bal. 217
Auto Improvement Co., New York City. E.P. 109
Bosch Magneto Co., New York City. S.T.B. 400-403
J. S. Bretz Co., Times Bldg., New York City. Bal. 214
Champion Ignition Co., Flint, Mich. Bal. 240
Albert Champion Co., Boston. B. 507
Heinze Electric Co., Lowell, Mass. E.P. 175
Hess-Bright Mfg. Co., Philadelphia C.H. 304
Herz & Company, 235 Lafayette St., New York City. E.P. 112
K-W Ignition Co., 1686 Broadway, New York City. Bal. 223
Lavalette & Company, 112 W. 42d St., New York City. B. 517
Motzinger Device Mfg. Co., Pendleton, Ind. E.P. 155
Philadelphia Timer & Mach. Co., Philadelphia. Bal. 236
Remy Electric Co., Anderson, Ind. E.P. 125
C. F. Splitdorf, 261 Walton Ave., New York City. E.P. 102
F. H. Wheeler, Indianapolis. E.P. 137
Witherbee Igniter Co., 1876 Broadway, N. Y. City. E.P. 138

TIRE ACCESSORIES.

Allen Auto Specialty Co., New York City. Bal. 207
Atlas Rubber Co., Buffalo, N. Y. Bal. 239
Auto Tire Inflator Co., Brooklyn, N. Y. T.T.B. 430
E. T. Burrowes Co., Portland, Me. B. 508
Dow Demountable Rim, New York City. B. 569
Faultless Auto Tube Co., New York City. B. 566
Gilbert Mfg. Co., New Haven, Conn. E.P. 108
Hopewell Bros., Cambridge, Mass. Bal. 213
Long & Mann Co., New York City. Bal. 234
Nadall Mfg. Co., Chicago. T.T.B. 428
J. H. Sager Co., Rochester, N. Y. E.P. 132
Seamless Rubber Co., New Haven, Conn. S.T.B. 408
C. A. Shaler, Waupun, Wis. Bal. 202
Standard Leather Washer Mfg. Co., Newark. T.T.B. 441
Travers Blowout Patch Co., New York City. S.T.B. 406
Trenton Rubber Mfg. Co., Trenton, N. J. Bal. 244
U. S. Spare Wheel Co., Detroit. B. 556
Weed Chain Tire Grip Co., New York City. E.P. 135

STEAM PLEASURE CARS.

WHITE: The White Co., Cleveland. E.P. 30

COMMERCIAL VEHICLES.

CHAMPION: Champion Wagon Co., Owego, N. Y. B. 77
FRANKLIN: H. H. Franklin Mfg. Co., Syracuse, N. Y. B. 78
GENERAL: General Vehicle Co., New York City. B. 76
HEWITT: Hewitt Motor Truck Co., New York City. B. 85
KNOX: Knox Automobile Co., Springfield, Mass. B. 75
SAMPSON: Alden Sampson Co., Pittsfield, Mass. B. 84
STUDEBAKER: Studebaker Auto Co., South Bend, Ind. B. 81
THOMAS: E. R. Thomas Motor Co., Buffalo, N. Y. B. 82

MOTORCYCLES.

American Motor Co., Brockton, Mass. B. 535
Aurora Automatic Machine Co., Aurora, Ill. B. 542
Auto-Bi Company, Buffalo, N. Y. B. 545
F. A. Baker & Co., New York City. B. 537
Bicycling World Co., New York City. B. 539
Consolidated Mfg. Co., Toledo, O. B. 531
Crouch Motor Co., Stoneham, Mass. B. 554
G. H. Curtiss Mfg. Co., Hammondsport, N. Y. B. 550
Eclipse Machine Co., Elmira, N. Y. B. 551
Excelsior Supply Co., Chicago. B. 532
Harley-Davidson Motor Company, Milwaukee. B. 544
Hendee Mfg. Co., Springfield, Mass. B. 536
Merkel Light Motor Co., Pottstown, Pa. B. 529
H. & F. Mesinger Mfg. Co., New York City. B. 549
Motor Car Equipment Co., New York City. B. 547
Motorcycle Pub. Co., New York City. B. 534
New Era Gas Engine Co., Dayton, O. B. 552
N. S. U. Motor Co., New York City. B. 533
Ovington Motor Co., New York City. B. 540
Persons Mfg. Co., Worcester, Mass. B. 555
Pierce Cycle Co., Buffalo, N. Y. B. 538
Reading Standard Co., Reading, Pa. B. 541
Reliance Motor Cycle Co., Owego, N. Y. B. 553
Royal Motor Works (Inc.), Worcester, Mass. B. 543
Thiem Mfg. Co., Minneapolis, Minn. B. 546
Walton Motor Co. (Inc.), Lynbrook, L. I., N. Y. B. 548

TIRES.

Ajax-Grieb Rubber Co., Trenton, N. J. E.P. 134
Diamond Rubber Co., Akron, O. E.P. 101
Consolidated Rubber Tire Co., Springfield, O. E.P. 136
Continental Caoutchouc Co., New York City. E.P. 130
Dow Tire Company, New York City. E.P. 126
G & J Tire Co., Indianapolis, Ind. E.P. 106
Empire Auto Tire Co., Trenton, N. J. E.P. 122
Firestone Tire & Rubber Co., Akron, O. E.P. 149
B. F. Goodrich Co., Akron, O. E.P. 100
Goodyear Tire & Rubber Co., Akron, O. E.P. 103
Fisk Rubber Co., Chicopee Falls, Mass. E.P. 166
Hartford Rubber Works Co., Hartford Conn. E.P. 171
Healy Leather Tire Co., New York City. B. 501
Leather Tire Goods Co., Newton Upper Falls, Mass. E.P. 143
Michelin Tire Co., Milltown, N. J. E.P. 142
Morgan & Wright, Detroit, Mich. E.P. 129
Motz Clincher Tire & Rubber Co., Akron, O. B. 525
Pennsylvania Rubber Co., Jeannette, Pa. E.P. 153
Republic Rubber Co., Youngstown, O. E.P. 139
Samson Leather Tire Co., New York City. S.T.B. 409-10
Swinehart Clincher Tire & Rubber Co., Akron, O. E.P. 124
Voorhees Rubber Mfg. Co., Jersey City, N. J. B. 227

BATTERIES.

Electric Storage Battery Co., Philadelphia. C.H. 315
Geiszler Bros., 514 W. 57th Sa., New York City. Bal. 248
Kitsee Storage Battery Co., Scranton, Pa. B. 503
Marko Storage Battery Co., Brooklyn, N. Y. T.T.B. 444
National Battery Co., Buffalo, N. Y. C.H. 307
National Carbon Co., Cleveland. C.H. 305
Philadelphia Storage Battery Co., Philadelphia. B. 563
Stanley & Patterson, 23 Murray St., New York. B. 522
Union Battery Co., Belleville, N. J. S.T.B. 412
Vesta Accumulator Co., 1781 B'way, N. Y. T.T.B. 425
Westchester Appliance Co., Yonkers, N. Y. C.H. 309
Witherbee Igniter Co., 1876 B'way New York. E.P. 138

COILS.

American Electric Fuse Co., New York City.....T.T.B. 431
Atwater-Kent Mfg. Co., Philadelphia.....E.P. 117
Auto Coil Company, Jersey City, N. J.....E.P. 123
Connecticut Tel. & Elec. Co., Meriden, Conn.....E.P. 128
Pittsfield Spark Coil Co., Dalton, Mass.....E.P. 168
Remy Electric Co., Anderson, Ind.....E.P. 125
C. F. Splitdorf, 261 Walton Ave., New York City....E.P. 102

PLUGS, SWITCHES, AND GENERAL IGNITION.

American Elec. Novelty & Mfg. Co., New York City..E.P. 110
E. M. Benford, Mount Vernon, N. Y.....Bal. 222
Eastern Carbon Works, Jersey City, N. J.....Bal. 206
R. E. Hardy Co., 25 W. 42d St., New York City.....E.P. 133
High Frequency Ignition Coil Co., Los Angeles, Cal..Bal. 231
Jeffery Dewitt Company, Newark, N. J.....Bal. 208
Mica Core Mfg. Co., New York City.....T.T.B. 427
A. R. Mosler & Co., 163 W. 29th St., New York City..E.P. 172
Never-Miss Spark Plug Co., Lansing, Mich.....C.H. 321
N. Y. Coil Company, 338 Pearl St., New York City....Bal. 226
Pittsfield Spark Coil Co., Dalton, Mass.....E.P..168

AXLES AND BEARINGS.

American Ball Bearing Co., Cleveland.....E.P. 164
J. S. Bretz Co., Times Bldg., New York City.....Bal. 214
Hess-Bright Mfg. Co., Philadelphia.....C.H. 304
Hyatt Roller Bearing Co., Newark, N. J.....E.P. 178
Merchant & Evans Co., Philadelphia.....B. 524
New Departure Mfg. Co., Bristol, Conn.....B. 556b
R. I. V. Company, 1771 Broadway, New York City.....Bal. 238
Standard Roller Bearing Co., Philadelphia.....C.H. 311
Timken Roller Bearing Co., Canton, O.....E.P. 151

RADIATORS, PUMPS, MUFFLERS, AND HORNS

Auto Pump Co., Springville, N. Y.....Bal. 219
Auto Supply & Mfg. Co., Brooklyn, N. Y.....B. 516
A-Z Company, 527 W. 56th St., New York City.....Bal. 230
Briscoe Mfg. Co., Newark, N. J.....E.P. 107
Comptoir D'Innovations Pour Automobiles, N. Y. City..B. 557
Gabriel Horn Mfg. Co., Cleveland.....E.P. 173
Livingston Radiator Co., 6 E. 31st St., New York City.B. 511
McCord Mfg. Co., Detroit.....Bal. 200
Metal Stamping Co., 3050 Hubert St., New York City.Bal. 211
Randall-Faichney Co., Boston.....C.H. 312
Sireno Company, 39 Cortlandt St., New York City..S.T.B. 416

LAMPS.

Atwood-Castle Co., Amesbury, Mass.....E.P. 156
Badger Brass Mfg. Co., Kenosha, Wis.....E.P. 165
R. E. Dietz Co., 60 Laight St., New York City.....E.P. 116
Edmunds & Jones Mfg. Co., Detroit.....C.H. 313
Gray & Davis, Amesbury, Mass.....E.P. 114
C. T. Ham Mfg. Co., Rochester, N. Y.....E.P. 176
Lux Auto Lamp Mfg. Co., New York City.....T.T.B. 442
Manhattan Screw & Stamping Wks., New York City..C.H. 316
Rose Mfg. Co., Philadelphia.....E.P. 169
Rushmore Dynamo Works, Plainfield N. J.....Bal..220

LUBRICANTS AND LUBRICATORS.

Adam Cook Sons, 313 West St., New York City.....E.P. 144
Columbia Lubricants Co., 116 Broad St., New York..C. H. 303
Duffy Grease Co., 520 W. 40th St., New York City..S.T.B. 417
A. W. Harris Oil Co., Providence, R. I.....E.P. 159
Havoline Oil Co., 80 Broad St., New York City.....Bal. 216
Geo. A. Haws, 73 Pine St., New York City.....Bal. 201
Joseph Dixon Crucible Co., Jersey City, N. J.....E.P. 174
Keystone Lubricating Co., Philadelphia.....Bal. 233
Lunkenheimer Co., Cincinnati, O.....C.H. 306
W. P. Miller Sons, Long Island City, N. Y.....Bal. 249
McCord Mfg. Co., Detroit, Mich.....Bal. 200
New York & New Jersey Lub. Co., New York City....E.P. 119
Noera Mfg. Co., Waterbury, Conn.....C.H. 302
W. C. Robinson & Sons Co., Baltimore.....Bal. 203
Vacuum Oil Co., 29 Broadway, New York City.....E.P. 111
White & Bagley Co., Worcester, Mass.....B. 512
W. R. Winn, 143 Maiden Lane, New York City.....Bal. 225
O. W. Young, Newark, N. J.....Bal. 245

MATERIALS.

Anderson Forge & Machine Co., Detroit.....Bal. 246
Wm. Cramp & Sons, Philadelphia.....E.P. 158
Davis Bournonville Co., 90 West St., New York..S.T.B. 411-12
Erie Foundry Co., Erie, Pa.....S.T.B. 414
H. H. Franklin Mfg. Co., Syracuse, N. Y.....Bal. 232
Globe Mach. & Stamping Co., Cleveland.....E.P. 147
I. G. Johnson & Co., Spuyten Duyvil, N. Y.....Bal. 218
Light Mfg. & Foundry Co., Pottstown, Pa.....E.P. 121
Manufacturers Foundry Co., Waterbury, Conn.....E.P. 154
Thos. Prosser & Son, 15 Gold St., New York City..E.P. 146
Paul S. Reeves & Son, Philadelphia.....S.T.B. 407
Shelby Steel Tube Co., Pittsburg.....E.P. 104
A. O. Smith Co., Milwaukee, Wis.....Bal. 205
U. S. McAdamite Metal Co., Brooklyn, N. Y.....B. 528

CARBURETERS.

Byrne-Kingston & Co., Kokomo, Ind.....E.P. 157
G. L. Economizer Co., Times Bldg., New York.....B. 556a
Stromberg Motor Devices Co., New York City.....B. 509
F. H. Wheeler, Indianapolis, Ind.....E.P. 137

ENGINES, TRANSMISSIONS, AND STEERING.

American & British Mfg. Co., Bridgeport, Conn.....C.H. 324
Brennen Mfg. Co., Syracuse, N. Y.....E.P. 160
Brown-Lipe Gear Co., Syracuse, N. Y.....E.P. 105
Gemmer Mfg. Co., Detroit.....C.H. 318
Merchant & Evans Co., Philadelphia.....B. 524
Spicer Universal Joint Mfg. Co., Plainfield, N. J.....E.P. 131
Warner Gear Co., Muncie, Ind.....E.P. 161

GASOLINE AND OTHER TANKS.

Avery Portable Lighting Co., Milwaukee, Wis.....E.P. 145
S. F. Bowser & Co., Fort Wayne, Ind.....E.P. 113
Hydraulic Oil Storage Co., New York City.....Bal. 212
Janney Steinmetz Co., Philadelphia.....E.P. 148

SHOCK ABSORBERS AND SPRINGS.

Burnett Compound Spring (Inc.), Newark, N. J.....Bal. 241
Ernest Flentje, Cambridge, Mass.....S.T.B. 415
Gabriel Horn Mfg. Co., Cleveland.....E.P. 173
Hartford Suspension Co., Jersey City, N. J.....E.P. 152
Perfection Spring Co., Cleveland.....B. 518
J. H. Sager Company, Rochester, N. Y.....E.P. 132

SHIELDS, TOPS, AND BODY MOUNTINGS.

Blue Ribbon Auto & Carriage Co., Bridgeport, Conn..B. 568
L. C. Chase & Co., Boston, Mass.....C.H. 301
Chicago Windshield Co., Chicago.....S.T.B. 420
C. Cowles & Co., New Haven, Conn.....C.H. 319
English & Mersick Co., New Haven, Conn.....Bal. 221
L. J. Mutty Co., Boston.....Bal. 229
C. A. Mezger (Inc.), 1629 B'way, New York City.....C.H. 323
Pantasote Company, 11 Broadway, New York City..C.H. 314
Rands Mfg. Co., Detroit.....C.H. 325
Sprague Umbrella Co., Norwalk, O.....C.H. 300
Springfield Metal Body Co., Springfield, Mass.....C.H. 317
Geo. Stengel (Inc.), Newark, N. J.....B. 567
Troy Carriage Sunshade Co., Troy, O.....B. 564
Vanguard Mfg. Co., Joliet, Ill.....B. 523
Vehicle Apron & Hood Co., Columbus, O.....B. 513

SPEEDOMETERS.

Auto Improvement Co., Hudson St., New York City..E.P. 109
Hoffecker Company, Boston.....C.H. 308
Joseph F. Jones, B'way & 76th St., New York City..E.P. 127
Stewart & Clark Mfg. Co., Chicago.....C.H. 322
Veeder Mfg. Co., Hartford, Conn.....E.P. 115
Warner Instrument Co., Beloit, Wis.....E.P. 120

WHEELS AND CHAINS.

Baldwin Chain Mfg. Co., Worcester, Mass.....E.P. 118
Diamond Chain Mfg. Co., Indianapolis, Ind.....E.P. 167
Phineas Jones & Co., Newark, N. J.....E.P. 162
Chas. E. Miller, 97 Reade St., New York City.....Bal. 243
Whitney Mfg. Co., Hartford, Conn.....E.P. 170

WRENCHES AND OTHER TOOLS.

Buda Foundry & Mfg. Co., New York City.....Bal. 242
Coes Wrench Co., Worcester, Mass.....C.H. 320
Cooks Standard Tool Co., Kalamazoo, Mich.....Bal. 204
Duff Mfg. Co., Pittsburg, Pa.....E.P. 140
Elite Mfg. Co., Ashland, O.....T.T.B. 429
Garvin Machine Co., New York City.....B. 565
Noonan Tool & Mach. Works, Rome, N. Y.....B. 560
Oliver Mfg. Co., Chicago.....E.P. 150
Patterson, Gottfried & Hunter, New York City.....B. 500
Perfection Wrench Co., Port Chester, N. Y.....S.T.B. 413
Pratt & Whitney Co., 111 B'way, New York City.....B. 561
Quincy, Manchester, Sargent Co., Plainfield, N. J..T.T.B. 443

IN GENERAL.

H. A. Allers & Co., 136 Liberty St., New York City..S.T.B. 405
American Thermos Bottle Co., Brooklyn, N. Y.....Bal. 228
American Thermo Ware Co., New York City.....B. 514
Austro-American Separator Co., Cleveland.....Bal. 224
A. O. Brictson, Brookings, S. D.....T.T.B. 440
Caloris Mfg. Co., Philadelphia.....S.T.B. 418
Class Journal Co. ("Motor Age"), Chicago.....B. 504
Class Journal Co. ("Automobile"), New York City....B. 505
Chandler Co. (Inc.), Pittsburg, Pa.....E.P. 141
Chilton Printing Co., Philadelphia.....B. 515
Columbia Nut & Bolt Co. (Inc.), Bridgeport, Conn..S.T.B. 404
M. H. Cormack & Co., 1876 B'way, New York City..Bal. 247
Commercial Acetylene Co., 80 B'way, New York City..B. 521
C. J. Downing, 54 Warren St., New York City.....B. 502
Hill Dryer Co., Worcester, Mass.....B. 513a
H & C Bottle Mfg. Co., 652 B'way, New York City..T.T.B. 439
Jarman & Baker, 1779 B'way, New York City.....Bal. 237
Julius Lucas & Co., Lane, New Y ork City.T.T.B. 438
Julius King Optical Co., 10 Maiden Lane, New York..B. 510
John Lucas & Co., 89 Maiden Lane, New York City.T.T.B. 438
Morrison Ricker Mfg. Co., Grinnell, Ia.....Bal. 209
N. Y. Sporting Goods Co., 17 Warren St., New York..Bal. 210
Nathan Novelty Mfg. Co., 84 Reade St., New York..B. 559
Post & Lester Co., Hartford, Conn.....B. 526
Pierson Motor Supply Co., New York City.....Bal. 215
P. Rielly & Son, Newark, N. J.....Bal. 235
Standard Welding Co., Cleveland.....E.P. 163
Valentine & Co., 257 Broadway, New York City.....E.P. 177

ACTUAL CARS ON EXHIBITION AT THE GARDEN

STANDARDIZED automobiles, in so far as the word can be made to apply to any industry that expects to keep step with time, is the proper phraseology to apply to the cars for the Garden. Even a cursory examination of the tabulation given in conjunction with this discussion will be enough to convince anyone who may have been at all familiar with the situation that the A. L. A. M. has gone into the matter on a basis which has for its underlying strata the standardization of the parts, and, to the extent possible, the standardization of the types of cars.

In some respects it is quite out of the question to gain headway in the matter of fixing upon standards, especially if reference is had to certain special applications along lines in which deviations have to be made to suit local conditions. On the other hand, it is better to try to crystallize the cars than to go on making things different year after year, with the full assurance that all the changes cannot possibly be right, any more than it is a fact that every man who goes into business will make a go of it.

In car building it has long been the custom to follow standards, and the M. C. B. (Master Car Builders) rule is followed in the design of all the devices that can with safety be reduced to a standard, without throttling the progress that is so important in any industry. The argument has been advanced to the effect that standardizing will tie the hands of designers and throttle genius. In this connection it would not be out of order to say that the designer who could be so easily flagged would scarcely be capable of evolving anything that an autoist would want to pay money for. Then, there is the success of the M. C. B. to be noted. Certainly, railroad cars were not reduced to anything but quality as the result of standardizing, and it is not easy to show anything but advantage from the process. Indeed, not only the quality of the work and the cost, but the progress made can be directly traced to the fact that the M. C. B. did regulate in so far as standards can be fixed and up to the limit of the ability of a body of representative men to agree.

The Garden cars will show the result of the several years of careful consideration that they have received at the hands of the engineers, who met on occasions, and in converse exchanged ideas and arrived at conclusions. It is not to be supposed that they agreed on every point, nor can it be said that they used all the ideas that went the rounds. What they did do was to talk it over, and in doing so it is assured that each was the better able to cope with his own problem after he listened to the objections as they were put before him at the hands of able critics of no mean ability.

Garden Show Cars Tried Out.

Of course there are the builders of devices, even automobiles, who prefer to try their product out in public, and even on the public. One might ask, Does it pay? On the other hand, it is rather an advantage of the cars at the Garden that they are tried out. The public does not have to consider this phase of the problem; the same public is in possession of much definite information in relation to the performance of the cars. There is one other phase of the subject that will stand mention in this connection. Take, for illustration, the companies that do bring out new models for the first time; they should be able to avoid mistakes if they have a source of reliable information such as is the case with the companies at the Garden.

On the whole, then, the cars as they will follow do represent the accumulated knowledge of half a decade, pyramided and placed at the disposal of the men behind the automobiles on exhibition. This may be the reason why they look more or less alike. In a word, they are alike in all the standard features on which the engineers could agree in every case in which the cars are for a given class of service. This is not to say that the touring cars, for illustration, are prototypes of each other, though they all have chassis frames of the channel section, with one or two notable exceptions, as Franklin, using the laminated wood frame. All use ball or roller bearings in the hubs of the road wheels, and all follow out certain safe practices in this regard.

Likewise, crankshaft work is on a basis which differs but little between the cars, even if all the cars do not have motors with crankshafts of the same dimensions, although it is possible that all may have limiting values of the extreme fiber strain and all may have kinetic ability parallel to the kinetic work. These are the matters which make the differences in the long run, and unfortunately they are the questions that will be the hardest to put before the buyers of cars in a manner to be convincing.

It will be quite easy to lay bare the body work of the cars of the year, since in this important part of the cars good common sense has taken charge, and the straight line effect in the body work is but a fitting indication of the straightforward work that will be found in about every case under the handsome finish. As a general rule the wheelbase in the 1909 cars is longer than formerly, and this is turn indicates more room in the cars. The lengthening has been in all the types of cars, from the little runabout to the big touring car, with the exception of the town car and taxicab types, where they have been kept short, to give a good turning radius in the congested streets of the cities.

Good Representation of "Sixes."

The power plants in the 1909 cars are well divided, in that there is a fair sprinkling of the "sixes," and the "fours" are in profusion, with the usual number of the "double opposed" and just as many single-cylinder motors as last year. As to the power of the motors, some say the big power plants are on the wane; but it is a case of more of the small-power plants than formerly, not less of the plants of the larger rating. In other words, it may be true that there is a big demand for cars of medium power, to some extent taking the place of the demand for runabout types of cars, but it is also a fact that the users of the cars with the large power plants are in great presence, and they are demanding more, not less, power.

As respects transmissions, the selective type seems to be in the majority, and direct high is the most used combination. Some hold to the progressive; there is at least one semi-progressive; and planetary gears are as before used in certain classes of work. The workmanship is on a high plane, using alloy steel or special grades of steel in about every case. The levers and linkages are well designed, and the materials are good. There are examples of the "left-hand steer" to be seen, and it may be the plan will grow to very wide proportions.

There is a decided tendency to use better wheels, and the rims are largely of the "demountable" or other "quick detach" plan. Spare wheels are used, some with rims only. In other cases the entire wheel is furnished.

GASOLINE PLEASURE VEHICLES

MAKE AND MODEL	Price	A. L. A. M. H. P. Rating	CYLINDERS Bore	Stroke	No.	Wheelbase	Radiator	IGNITION Magneto	Battery	Clutch	TRANSMIS'N Type	Speeds	Drive	Brakes	TIRES Front	Rear	BODY Type	Seats
CARS COSTING $1000 OR LESS																		
WALTHAM—17	$350	4	3 1/4	4 1/4	1	84	Air		Dry		Fric.	5	Ch'ns	2	26x2 1/2	26x2 1/2	B'kb'rd	1
CADILLAC—T	$950	10	5	5	1	82	Tubular		Dry	Disc	Plan.	2	Chain	2	30x3 1/2	30x3 1/2	Tour'g.	4
CARS COSTING BETWEEN $1000 AND $2000																		
E-M-F—30	$1,250	25	4	4 1/2	4	106	Tubular	H. T.	Dry	Ex. Ring	Sel.	3	Shaft	4	32x3 1/2	32x3 1/2	R'dster.	3
E-M-F—30	$1,250	25	4	4 1/2	4	106	Tubular	H. T.	Dry	Ex. Ring	Sel.	3	Shaft	4	32x3 1/2	32x3 1/2	Tour'bt	4
E-M-F—30	$1,250	25	4	4 1/2	4	106	Tubular	H. T.	Dry	Ex. Ring	Sel.	3	Sh'ft.	4	32x3 1/2	32x3 1/2	S. Ton.	4
E-M-F—30	$1,250	25	4	4 1/2	4	106	Tubular	H. T.	Dry	Ex. Ring	Sel.	3	Sh'ft.	4	32x3 1/2	32x3 1/2	Tour'g.	5
CADILLAC—30	$1,400	25	4	4 1/2	4	106	Tubular		D. & St'ge	Cone	Sel.	3	Sh'ft.	4	32x3 1/2	32x3 1/2	R'dster.	3
CADILLAC—30	$1,400	25	4	4 1/2	4	106	Tubular		D. & St'ge	Cone	Sel.	3	Sh'ft.	4	32x3 1/2	32x3 1/2	S. Ton.	4
CADILLAC—30	$1,400	25	4	4 1/2	4	106	Tubular		D. & St'ge	Cone	Sel.	3	Sh'ft.	4	32x3 1/2	32x3 1/2	Tour'g.	5
CHALMERS-DETROIT—30	$1,500	24	3 7/8	4 1/2	4	110	Tubular		Storage	Mul. Disc	Sel.	3	Sh'ft.	3	32x3 1/2	32x3 1/2	R'bout.	3 or 4
CHALMERS-DETROIT—30	$1,500	24	3 7/8	4 1/2	4	110	Tubular		Storage	Mul. Disc	Sel.	3	Sh'ft.	3	32x3 1/2	32x3 1/2	Tour'g.	5
ELMORE—33	$1,750	2-cycle	4 1/2	4	3	104	H'comb.	A.K.G'r	Dry	Ex. Ring	Sel.	3	Sh'ft.	4	32x4	32x4	R'dster.	3 or 4
ELMORE—33	$1,750	2-cycle	4 1/2	4	3	104	H'comb.	A.K.G'r	Dry	Ex. Ring	Sel.	3	Sh'ft.	4	32x4	32x4	Tour'g.	5
FRANKLIN—G	$1,850	18	3 5/8	4	4	91 1/2	Air	H. T.		Mul. Disc	Prog.	3	Sh'ft.	3	32x3	32x3 1/2	Tour'g.	4
SELDEN—29	$2,000	29	4 1/4	4 1/2	4	114	Tubular		Storage	Cone	Sel.	3	Sh'ft.	4	34x3 1/2	34x3 1/2	R'dster.	3 or 4
SELDEN—29	$2,000	29	4 1/4	4 1/4	4	114	Tubular		Storage	Cone	Sel.	3	Sh'ft.	4	34x3 1/2	34x4	Tour'g.	5
CARS COSTING BETWEEN $2000 AND $3000																		
PALMER-SINGER—32	$2,250	28	4 1/4	4 1/2	4	107	H'comb.	H. T.		Mul. Disc	Sel.	4	Sh'ft.	4	34x4	34x4	R'bout.	2
ELMORE—33	$2,250	2-cycle	4 1/2	4	3	104	H'comb.	A.K.G'r	Dry	Ex. Ring	Sel.	3	Sh'ft.	4	32x4	32x4	Land'l't	5
APPERSON—O	$2,450	30	4 3/8	5	4	119	Tubular	H. T.	Storage	Con. B'd.	Sel.	3	Sh'ft.	4	34x4	34x4	Tour'g.	5
CHALMERS-DETROIT—30	$2,500	24	3 7/8	4 1/2	4	110	Tubular		Storage	Mul. Disc	Sel.	3	Sh'ft.	3	32x3 1/2	32x3 1/2	Lim'sne	7
CORBIN—O2 or S2	$2,500	32	4 1/2	4 1/4	4	108	H'comb.		D. & St'ge	Cone	Sel.	3	Sh'ft.	4	32x3 1/2	32x4	R'bout.	3 or 4
CORBIN—K2 or R2	$2,500	32	4 1/2	4 1/4	4	108	H'comb.		D. & St'ge	Cone	Sel.	3	Sh'ft.	4	34x3 1/2	34x4	Tour'g.	5
ELMORE—44	$2,500	2-cycle	4 1/2	4	4	110	H'comb.	A.K.G'r	Dry	Ex. Ring	Sel.	3	Sh'ft.	4	34x4	34x4	Tour'g.	5
CORBIN—O2 or S2	$2,650	32	4 1/2	4	4	108	H'comb.		D. & St'ge	Cone	Sel.	3	Sh'ft.	4	32x3 1/2	32x4	S. Ton.	4
COLUMBIA—48	$2,750	29	4 1/4	4 1/2	4	115	Cellular	L. T.		Cone	Sel.	3	Sh'ft.	4	34x3 1/2	34x4	Tour'g.	5
CHALMERS-DETROIT—40	$2,750	40	5	4 3/4	4	112	Tubular		Storage	Cone	Sel.	3	Sh'ft.	3	34x4	34x4	R'bout.	3 or 4
CHALMERS-DETROIT—40	$2,750	40	5	4 3/4	4	112	Tubular		Storage	Cone	Sel.	3	Sh'ft.	3	34x4	34x4	Tour'g.	5
POPE-HARTFORD—S	$2,750	30	4 5/16	5 1/8	4	114	Planetic		D. & St'ge	Cone	Sel.	3	Sh'ft.	3	34x4	34x4	S. Ton.	4
POPE-HARTFORD—S	$2,750	30	4 5/16	5 1/8	4	114	Planetic		D. & St'ge	Cone	Sel.	3	Sh'ft.	3	34x4	34x4	Tour'g.	5
STEVENS-DURYEA—X	$2,750	36	4 3/4	4 1/2	4	124	Cellular		D. & St'ge	Mul. Disc	Prog.	3	Sh'ft.	4	34x4	34x4	Tour'g.	5
FRANKLIN—D	$2,800	28	4 1/4	4	4	106	Air	H. T.		Mul. Disc	Sel.	3	Sh'ft.	3	36x3 1/2	36x4	Tour'g.	5
STEVENS-DURYEA—XXX	$2,850	36	4 3/4	4 1/2	4	109	Cellular	H. T.	Dry	Mul. Disc	Prog.	3	Sh'ft.	4	36x3 1/2	36x4	R'bout.	3
POPE-HARTFORD—S	$2,815	30	4 5/16	5 1/8	4	114	Planetic		D. & St'ge	Cone	Sel.	3	Sh'ft.	3	34x4	34x4	R'dster.	5
HAYNES—XI	$2,900	36	4 3/4	5	4	112	Cellular	H. T.	Dry	Con. B'd.	Sel.	3	Sh'ft.	4	36x4	36x4	R'bout.	3
KNOX—O	$2,900	38	4 7/8	4 3/4	4	102	Cellular	H. T.	Dry	3-Plate	Sel.	3	Sh'ft.	4	34x4	34x4	R'bout.	4
KNOX—O	$2,950	38	4 7/8	4 3/4	4	114	Cellular	H. T.	Dry	3-Plate	Sel.	3	Sh'ft.	4	34x4	34x4	S. Ton.	4
APPERSON—M	$3,000	36	4 3/4	5	4	106	Tubular	H. T.	Storage	Con. B'd.	Sel.	3	Sh'ft.	4	34x4	34x4	R'bout.	4
KNOX—O	$3,000	38	4 7/8	4 3/4	4	114	Cellular	H. T.	Dry	3-Plate	Sel.	3	Sh'ft.	4	34x4	34x4	Tour'g.	5
HAYNES—X	$3,000	36	4 3/4	5	4	112	Cellular	H. T.	Dry	Con. B'd.	Sel.	3	Sh'ft.	4	36x4	36x4	Tour'g.	7
POPE-HARTFORD—S	$3,000	30	4 5/16	5 1/8	4	114	Planetic		D. & St'ge	Cone	Sel.	3	Sh'ft.	3	34x4	34x4	Tour'g.	7
SELDEN—29	$3,000	29	4 1/4	4 1/2	4	114	Tubular		Storage	Cone	Sel.	3	Sh'ft.	4	34x3 1/2	34x4	Lim's'e.	6
THOMAS FLYER—4-16	$3,000	18	3 3/8	4 5/16	4	103	Tubular	H. T.		3-Disc	Sel.	3	Sh'ft.	4	32x4	32x4	Br'g'm.	6
THOMAS-FLYER—6-40	$3,000	31	3 3/8	4 5/16	6	122	H'comb.	H. T.	A.K.Gen'r	3-Disc	Sel.	3	Sh'ft.	4	36x3 1/2	36x4	Flyab't.	4
THOMAS FLYER—6-40	$3,000	31	3 3/8	4 5/16	6	122	H'comb.	H. T.	A.K.Gen'r	3-Disc	Sel.		Sh'ft.	4	36x3 1/2	36x4	Tour'g.	6
WINTON—6-17	$3,000	48	4 1/2	5	6	120	Tubular	H. T.	Dry	Mul. Disc	Sel.	3	Sh'ft.	4	34x4	34x4 1/2	R'bout.	4
WINTON—6-17	$3,000	48	4 1/2	5	6	120	Tubular	H. T.	Dry	Mul. Disc	Sel.	3	Sh'ft.	4	34x4	34x4 1/2	Tour'g.	5
CARS COSTING BETWEEN $3000 AND $4000																		
PIERCE-ARROW—24	$3,100	24	3 15/16	4 3/4	4	111 1/2	Cellular	H. T.	Storage	Cone	Sel.	4	Sh'ft.	4	34x3 1/2	34x4	R'bout.	3
STEARNS—15-30	$3,200	32	4 1/2	4 9/16	4	116	Cellular	Bosch	Dry	Ex. B'd.	Sel.	3	Sh'ft.	4	34x4	34x4	R'bout.	3
STEARNS—15-30	$3,200	32	4 1/2	4 9/16	4	116									34x4	34x4	Tour'g.	5
PACKARD—18	$3,200	26	4 1/16	5 1/8	4	102	Cellular	L. T.	Storage	Ex. B'd.	Prog.	3	Sh'ft.	4	34x3 1/2	34x4	R'bout.	3
PACKARD—18	$3,200	26	4 1/16	5 1/8	4	112	Cellular	L. T.	Storage	Ex. B'd.	Prog.	3	Sh'ft.	4	34x4	34x4	Tour'g.	5
PALMER-SINGER—LXII	$3,250	57	4 3/8	5 1/2	6	126	H'comb.	H. T.		Mul. Disc	Sel.	4	Sh'ft.	4	36x4	36x4 1/2	R'bout.	3
APPERSON—M	$3,350	36	4 3/4	5	4	119	Tubular	H. T.	Storage	Con. B'd.	Sel.	3	Sh'ft.	4	34x4	34x4	Tour'g.	5
CORBIN—14	$3,500	32	4 1/2	4 1/4	4	114	H'comb.		D. & St'ge	Cone	Sel.	3	Sh'ft.	4	34x4	34x4 1/2	Limous.	5 or 7
PALMER-SINGER—LXII	$3,500	57	4 3/8	5 1/2	6	126	H'comb.	H. T.		Mul. Disc	Sel.	4	Sh'ft.	4	36x4	36x4 1/2	S. Ton.	4
PALMER-SINGER—XXXII	$3,500	28	4 1/4	4 1/2	4	112	H'comb.	H. T.		Mul. Disc	Sel.	4	Sh'ft.	4	34x4	34x4	Land't.	6
LOCOMOBILE—30	$3,500	32	4 1/2	4 1/2	4	120	Cellular	L. T.		Cone	Sel.	4	Sh'ft.	4	34x4	34x4 1/2	R'bout.	4
LOCOMOBILE—30	$3,500	32	4 1/2	4 1/2	4	120	Cellular	L. T.		Cone	Sel.	4	Sh'ft.	4	34x4	34x4 1/2	Tour'g.	5
ROYAL TOURIST—Y	$3,500	42	5 1/2	5 1/2	4	118	H'comb.	H. T.	Storage	Cone	Prog.	3	Sh'ft.	3	34x4 1/2	34x4 1/2	Cl. C'pe	4
ROYAL TOURIST—X	$3,500	42	5 1/2	5	4	114	H'comb.	H. T.	Storage	Cone	Prog.	3	Sh'ft.	3	36x4 1/2	36x4 1/2	Tour'g.	7
STEVENS-DURYEA—U	$3,500	36	3 7/8	4 3/4	6	114	Cellular		D. & St'ge	Mul. Disc	Prog.	3	Sh'ft.	4	34x4	34x4	Tour'g.	5
STUDEBAKER—A	$3,500	27	4 1/4	5 1/4	4	104	Cellular	L. T.		Cone	Prog.	3	Sh'ft.	3	34x4	34x4	Sub'b'n	4
LOZIER—Little Six	$3,500	33	3 1/4	4 1/2	6	116	H'comb.	H. T.	Storage	Mul. Disc	Sel.	3	Sh'ft.	4	36x3 1/2	36x4	Tour'g.	7
POPE-HARTFORD—S	$3,750	30	4 5/16	5 1/8	4	114	Planetic		D. & St'ge	Cone	Sel.	3	Sh'ft.	3	34x4	34x4	Land't.	7
COLUMBIA—48	$3,750	29	4 1/4	4 1/2	4	115	Cellular	L. T.		Cone	Sel.	3	Sh'ft.	4	34x3 1/2	34x4 1/2	Lim's'e.	7
STEVENS-DURYEA—X	$3,750	36	4 3/4	4 1/2	4	124	Cellular		D. & St'ge	Mul. Disc	Prog.	3	Sh'ft.	4	34x4	34x4	Lim's'e.	5
FRANKLIN—H	$3,750	43	4 1/4	4	6	127	Air	H. T.		Mul. Disc	Sel.	3	Sh'ft.	3	36x4	36x4 1/2	Tour'g.	7
STEARNS—15-30	$3,800	32	4 1/2	4 9/16	4	116	Cellular	H. T.	Dry	Ex. B'd.	Sel.	3	Sh'ft.	4	34x4	34x4	Land'l't	5
APPERSON—Little Six	$3,900	45	4 1/4	5	6		Cellular	H. T.	Storage	Con. B'd.	Sel.	4	Sh'ft.	4	34x4	34x4 1/2	Tour'g	7
PIERCE-ARROW—24	$3,950	24	3 15/16	4 3/4	4	111 1/2	Cellular	H. T.	Storage	Cone	Sel.	4	Sh'ft.	4	32x4	32x4 1/2	Land'l't	5
PIERCE-ARROW—36	$4,000	36	3 15/16	4 3/4	6	119	Cellular	H. T.	Storage	Cone	Sel.	4	Sh'ft.	4	34x4	34x4 1/2	Tour'g.	5
STEVENS-DURYEA—Y	$4,000	54	4 3/4	4 1/2	6	142	Cellular	H. T.	Storage	Mul. Disc	Prog.	3	Sh'ft.	4	36x4	36x5	Tour'g.	7
STUDEBAKER—B	$4,000	36	4 3/4	5 1/4	4	114	Cellular	L. T.		Cone	Sel.	4	Sh'ft.	4	34x4 1/2	34x4 1/2	Sp'd C'r	3
STUDEBAKER—D	$4,000	36	4 3/4	5 1/4	4	117	Cellular	L. T.		Cone	Sel.	4	Sh'ft.	4	36x4 1/2	36x4 1/2	Tour'g.	7

GASOLINE PLEASURE VEHICLES (Cont.)

MAKE AND MODEL	Price	A. L. A. M. H. P. Rating	CYLINDERS Bore	CYLINDERS Stroke	CYLINDERS No.	Wheelbase	Radiator	IGNITION Magneto	IGNITION Battery	Clutch	TRANSMIS'N Type	TRANSMIS'N Speeds	TRANSMIS'N Drive	Brakes	TIRES Front	TIRES Rear	BODY Type	BODY Seats
CARS COSTING BETWEEN $4000 AND $5000																		
PACKARD—30	$4,200	40	5	5 1/2	4	108	Cellular	L. T.	Storage	Ex. B'd	Prog.	4	Sh'ft.	4	36x3 1/2	36x4 1/2	R'bout.	3
PACKARD—30	$4,200	40	5	5 1/2	4	123	Cellular	L. T.	Storage	Ex. B'd	Prog.	4	Sh'ft.	4	36x4	36x4 1/2	Cl. C'pd	5
PACKARD—30	$4,200	40	5	5 1/2	4	123	Cellular	L. T.	Storage	Ex. B'd	Prog.	4	Sh'ft.	4	36x4	36x4 1/2	Tour'g.	7
WINTON—6-17	$4,250	48	4 1/2	5	6	120	Tubular	H. T.	Dry	Mul. Disc	Sel.	3	Sh'ft.	4	34x4	34x4 1/2	Lim's'e.	5
PEERLESS—19	$4,300	38	4 7/8	5 1/2	4	118 1/2	Tubular	L. T.	Stroage	Ex. B'd	Sel.	4	Sh'ft.	4	36x4	36x4 1/2	R'dster.	3
PEERLESS—19	$4,300	38	4 7/8	5 1/2	4	122	Tubular	L. T.	Storage	Ex. B'd	Sel.	4	Sh'ft.	4	36x4	36x4 1/2	Cl. C'pd	5
PEERLESS—19	$4,300	38	4 7/8	5 1/2	4	122	Tubular	L. T.	Storage	Ex. B'd	Sel.	4	Sh'ft.	4	36x4	36x4 1/2	Tour'g.	7
PACKARD—18	$4,300	26	4 1/16	5 1/8	4	112	Cellular	L. T.	Storage	Ex. B'd	Prog.	3	Sh'ft.	4	34x4	34x4	Lim's'e.	7
PACKARD—18	$4,400	26	4 1/16	5 1/8	4	112	Cellular	L. T.	Storage	Ex. B'd	Prog.	3	Sh'ft.	4	34x4	34x4	Land'lt.	7
WINTON—6-18	$4,500	60	5	5	6	130	Tubular	H. T.	Dry	Mul. Disc	Sel.	4	Sh'ft.	4	36x4	36x4 1/2	Tour'g.	7
LOCOMOBILE—40	$4,500	40	5	6	4	123	Cellular	L. T.		Cone	Sel.	4	Ch'ns	3	36x4	36x4 1/2	S. Ton.	4
LOCOMOBILE—40	$4,500	40	5	6	4	123	Cellular	L. T.		Cone	Sel.	4	Ch'ns	3	36x4	36x5	Tour'g.	7
MATHESON—E	$4,500	40	5	6	4	128	H'comb.	L. T.		Mul. Disc	Sel.	4	Ch'ns	4	36x4	36x5	Tour'g.	7
POPE-TOLEDO—XXI	$4,500	38	4 7/8	5 1/4	4	115	Planetic	H. T.	Storage	Mul. Disc	Sel.	4	Ch'ns	3	36x4	36x4 1/2	R'bout.	4
POPE-TOLEDO—XXII	$4,500	38	4 7/8	5 1/4	4	126	Planetic	H. T.	Storage	Mul. Disc	Sel.	4	Ch'ns	3	36x4	36x4 1/2	Tour'g.	7
ROYAL TOURIST—M	$4,500	48	5 1/2	6	4	126	H'comb.	H. T.	Storage	Cone	Sel.	4	Sh'ft.	3	36x4 1/2	36x5	Tour'g.	7
THOMAS FLYER—6-40	$4,500	31	3 9/16	4 6/16	6	122	H'comb.	H. T.	A.K.G'r.	3-Disc	Sel.	3	Sh'ft.	4	36x3 1/2	36x4	Lim's'e.	6
THOMAS FLYER—4-60	$4,500	53	5 3/4	5 1/2	4	127	H'comb.	H. T.	A.K.G'r.	3-Disc	Sel.	4	Ch'ns	4	36x4	36x5	Tour'g.	7
STEARNS—30-60	$4,600	46	5 3/8	5 7/8	4	121	Cellular	H. T.	Dry	Ex. B'd	Sel.	4	Ch'ns	3	36x4	36x4 1/2	S. Ton.	4
STEARNS—30-60	$4,600	46	5 3/8	5 7/8	4	124	Cellular	H. T.	Dry	Ex. B'd	Sel.	4	Sh'ft.	4	36x4	36x4 1/2	Tour'g.	7
PIERCE-ARROW—36	$4,650	36	3 15/16	4 3/4	6	119	Cellular	H. T.	Storage	Cone	Sel.	4	Sh'ft.	4	34x4	34x4 1/2	B'gh'm	5
APPERSON—K	$4,700	48	5 1/2	5	4	....	Cellular	H. T.	Storage	Con. B'd	Sel.	4	Op't'l	3	34x4	34x4 1/2	Tour'g	7
STEARNS—30-60	$4,750	46	5 3/8	5 7/8	4	121	Cellular	H. T.	Dry	Ex. B'd	Sel.	4	Ch'ns	3	36x4	36x5	Pullm'n	7
PIERCE-ARROW—48	$4,800	48	4 1/2	4 3/4	6	130	Cellular	H. T.	Storage	Cone	Sel.	4	Sh'ft.	4	36x4	36x4 1/2	Tour'g.	4
KNOX—M	$5,000	48	5 1/2	5 1/2	4	127	Cellular	H. T.	Dry	3-Disc	Sel.	4	Ch'ns	3	36x4 1/2	36x5	Tour'g.	7
LOZIER—H	$5,000	44	5 1/4	5 1/4	4	124	H'comb.	H. T.	Storage	Mul. Disc	Sel.	4	Sh'ft.	4	36x4	36x4 1/2	Br'cliff.	5
LOZIER—H	$5,000	44	5 1/4	5 1/4	4	124	H'comb.	H. T.	Storage	Mul. Disc	Sel.	4	Sh'ft.	4	36x4	36x5	Tour'g.	7
STUDEBAKER—D	$5,000	36	4 3/8	5 1/4	4	117	Cellular	L. T.		Cone	Sel.	4	Sh'ft.	4	36x4 1/2	36x4 1/2	Lim's'e.	7
WALTER—M	$5,000	48	5 1/2	5 1/2	4	122	H'comb.	H. T.	Storage	Cone	Sel.	4	Sh'ft.	4	36x4	36x5	Tour'g.	7
CARS COSTING ABOVE $5000																		
STUDEBAKER—B	$5,100	36	4 3/4	5 1/4	4	114	Cellular	L. T.		Cone	Sel.	4	Sh'ft.	4	34x4 1/2	34x4 1/2	Land'l't	7
PIERCE-ARROW—40	$5,400	40	5	5 1/2	4	124	Cellular	H. T.	Storage	Cone	Sel.	4	Sh'ft.	4	36x4	36x5	Lim's'e.	7
PEERLESS—19	$5,500	38	4 7/8	5 1/2	4	122	Tubular	L. T.	Storage	Ex. B'd	Sel.	4	Sh'ft.	4	36x4	36x5	Lim's'e.	7
PACKARD—30	$5,550	40	5	5 1/2	4	123 1/2	Cellular	L. T.	Storage	Ex. B'd	Prog.	3	Sh'ft.	4	36x4	36x4 1/2	Lim's'e.	7
PACKARD—30	$5,650	40	5	5 1/2	4	123 1/2	Cellular	L. T.	Storage	Ex. B'd	Prog.	3	Sh'ft.	4	36x4	36x4 1/2	Land'l't	7
ROYAL TOURIST—M	$5,700	48	5 1/2	6	4	126	H'comb.	H. T.		Cone	Sel.	4	Sh'ft.	3	36x4 1/2	36x5	Lim's'e.	7
SIMPLEX	$5,750	53	5 3/4	5 3/4	4	124	H'comb.	H. T.		Mul. Disc	Sel.	4	Ch'ns	4	36x4	36x5	Sp'd C'r	2
SIMPLEX	$5,750	53	5 3/4	5 3/4	4	127	H'comb.	H. T.		Mul. Disc	Sel.	4	Ch'ns	4	36x4	36x5	S. Car.	5
SIMPLEX	$5,750	53	5 3/4	5 3/4	4	127	H'comb.	H. T.		Mul. Disc	Sel.	4	Ch'ns	4	36x4	36x5	Tour'g.	7
STEARNS—30-60	$5,750	46	5 3/8	5 7/8	4	121	Cellular	H. T.	Dry	Ex. B'd	Sel.	4	Ch'ns	3	36x4	36x5	Lim's'e.	5
PEERLESS—19	$5,800	38	4 7/8	5 1/2	4	122	Tubular	L. T.	Storage	Ex. B'd	Sel.	4	Sh'ft.	4	36x4	36x5	Land'l't	7
LOCOMOBILE—40	$5,900	40	5	6	4	123	Cellular	L. T.		Cone	Sel.	4	Ch's.	3	36x4	36x5	Lim's'e.	7
LOZIER—H	$6,000	44	5 1/4	5 1/4	4	124	H'comb.	H. T.	Storage	Mul. Disc	Sel.	4	Sh'ft.	4	36x4	36x5	Lim's'e.	7
LOZIER—I	$6,000	51	4 9/16	5 1/2	6	131	H'comb.	H. T.	Storage	Mul. Disc	Sel.	4	Sh'ft.	4	36x4	36x5	Tour'g.	7
PEERLESS—25	$6,000	57	4 7/8	5 1/2	6	136	Tubular	L. T.	Storage	Ex. B'd	Sel.	4	Sh'ft.	4	36x4	36x5	Tour'g.	7
PIERCE-ARROW—60	$6,000	60	5	5 1/2	6	135	Cellular	H. T.	Storage	Cone	Sel.	4	Sh'ft.	4	36x4 1/2	36x5	Tour'g.	7
THOMAS-FLYER—4-60	$6,000	53	5 3/4	5 1/4	4	127	H'comb.	H. T.	A.K. Gen.	3-Disc	Sel.	4	Ch's.	4	36x4	36x5	Lim's'e.	7
THOMAS-FLYER—6-70	$6,000	72	5 1/2	5 1/2	6	140	H'comb.	H. T.	A.K. Gen.	3-Disc	Sel.	4	Ch's.	4	36x4 1/2	36x5	Tour'g.	7
PIERCE—48	$6,200	48	4 1/2	4 3/4	6	130	Cellular	H. T.	Storage	Cone	Sel.	4	Sh'ft.	4	36x4	36x5	Land'l't	7
SIMPLEX	$6,750	53	5 3/4	5 3/4	4	127	H'comb.	H. T.		Mul. Disc	Sel.	4	Ch's.	4	36x4	36x5	Land'l't	7
PEERLESS—25	$7,000	57	4 7/8	5 1/2	6	136	Tubular	L. T.	Storage	Ex. B'd	Sel.	4	Sh'ft.	4	36x4	36x5	Lim's'e.	7
PEERLESS—25	$7,200	57	4 7/8	5 1/2	6	136	Tubular	L. T.	Storage	Ex. B'd	Sel.	4	Sh'ft.	4	36x4	36x5	Land'l't	7

ELECTRIC PLEASURE VEHICLES

MAKE AND MODEL	Price	BODY Type	BODY Seats	Wheelbase	No. Motors	BATTERY No. Cells	BATTERY Type	Drive	Brakes	Steering	TIRES Front	TIRES Rear
COLUMBIA	$1,600	Phaeton	2	70	1	32	Exide	Chain	2	Wheel	30x3 1/2	30x3 1/2
BABCOCK	$2,000	Roadster	3	92	1	42	Babcock	Chains		Wheel	32x3 1/2	32x3 1/2
BABCOCK	$2,500	Town Car	4	....	1	42	Babcock	Chains		Wheel	32x4 1/2	32x4 1/2
BABCOCK—6	$1,700	Phaeton	2	78	1	36	Babcock	Chains	3	Wheel	32x3 1/2	32x3 1/2
BABCOCK—1	$1,800	Special	2	66	1	40	Babcock		3	Wheel	32x3	36x3 1/2
BABCOCK—10	$2,100	Coupe	2	78	1	36	Babcock	Chains	3	Wheel	32x3 1/2	32x3 1/2
BABCOCK—7	$4,000	Brougham	7	....	2	40	Babcock	Gear	3	Wheel	32x3 1/2	36x4
BAKER—R	$1,850	Runabout	2	70	1	30	Exide	Chain	4	Wheel	32x3 1/2	32x3 1/2
BAKER	$2,500	Coupe	2	70	1	28	Exide	Chain	4	Lever	32x3 1/2	32x3 1/2
BAKER—L	$1,850	Victoria	2	70	1	24	Exide	Chain	4	Lever	30x3 1/2	30x3 1/2
BAKER—M	$2,500	Roadster	3	95	1	40	Exide	Shaft	3	Wheel	34x4	34x4
BAKER—I	$4,000	Brougham	6	87	1	40	Exide	Shaft	4	Wheel	34x4	34x4 1/2
STUDEBAKER		Coupe	2	67	1	24		Chain	2	Lever	30x3	30x3 1/2
STUDEBAKER		Stanhope	2	73	1	36		Chain	2	Lever	30x4	30x4

ELECTRIC PLEASURE VEHICLES (Cont.)

MAKE AND MODEL	Price	BODY Type	BODY Seats	Wheelbase	No. Motors	BATTERY No.Cells	BATTERY Type	Drive	Brakes	Steering	TIRES Front	TIRES Rear
WAVERLY—74	$1,500	Stanhope	2	70	1	30	Exide	Ch. & G'r.	3	Lever	30x3	30x4
WAVERLY—75C	2,150	Victoria	4	65	1	30	Exide	Ch. & Gr.	3	Lever	30x4	30x4
WOODS—214	2,100	Victoria	4	73½	1	40	Exide	Chain	3	Lever	30x3½	34x3½
WOODS—214A	2,700	Combination	4	73½	1	40	Exide	Chain	3	Lever	30x3½	34x3½
DETROIT—L	1,350	Roadster	2	87	1	16	Optional	Gears	2	Optional	32x3½	32x3½
DETROIT—A	1,850	Victoria	2	74	1	24	Optional	Chain	2	Lever	32x3½	32x4
DETROIT—B	1,900	Victoria	2	74	1	24	Optional	Chain	2	Lever	32x3½	32x4
DETROIT—C	2,250	Coupe	2	74	1	24	Optional	Chain	2	Lever	32x3½	32x4
DETROIT—D	2,400	Brougham	4	74	1	24	Optional	Chain	2	Lever	32x3½	32x4
RAUCH & LANG—10	1,900	Stanhope	2	74	1	24	Exide	Chain	2	Lever	32x3½	32x3½
RAUCH & LANG—12	2,050	Stanhope	2	74	1	24	Exide	Chain	2	Lever	34x3½	34x3½
RAUCH & LANG—13	2,200	Victoria	4	82	1	24	Exide	Chain	2	Lever	32x3½	34x3½
RAUCH & LANG—144S	2,700	Coupe	4	82	1	40	Exide	Chain	2	Lever	34x4	34x4
RAUCH & LANG—144	2,800	Coupe	4	82	1	40	Exide	Chain	2	Lever	34x4	34x4

STEAM PLEASURE VEHICLES.

MODEL	Price	H.P.	ENGINE No. Cylinders	ENGINE BORE H. P.	ENGINE BORE L. P.	ENGINE Stroke	Wheelbase	Brakes	TIRES Front	TIRES Rear	BODY Type	BODY Seats
WHITE—O	$2,000	20	2	2½	4½	3	104	4	32x3½	32x3½	Touring	5
WHITE—M	$4,000	40	2	3½	6	4½	122	4	36x4	36x5	Touring	5

COMMERCIAL VEHICLES

MAKE AND MODEL	Price	A.L.A.M. Rating H.P.	CYLIND'RS Bore	CYLIND'RS Stroke	CYLIND'RS No.	Wheelbase	Radiator	IGNITION Magn'o	IGNITION Battery	Clutch	TRANSMISS'N Type	TRANSMISS'N Speeds	TRANSMISS'N Drive	Brakes	TIRES Front	TIRES Rear	BODY Type	BODY Capac'y
KNOX—20	$1,400	12	5	8	1	85	Air		Dry		Plan.	2	Ch's.	4	32x3	36x3	Chassis	½ Ton
AUTOCAR—18	$2,225	18	4¾	4½	2	85–97	Tubular	H. M.	Dry	Ring	Prog.	3	Sh'ft.	3	32x3½	32x3½	Utility	1 Ton
STUDEBAKER—2007	$2,300	2 M't'rs	Elec	tric	..	92							Ch's.	..	36x3	42x3	Delivery	1500 lbs
STUDEBAKER	$2,500	2 M't'rs	Elec	tric	..	92							Ch's.	..	36x3	42x3	Amb'l'ce	.....
STUDEBAKER—2008	$2,700	2 Mot'rs	Elec	tric	..	111							Ch's.	..	36x4	42x4	Truck	1½ Tons
HEWITT	$3,000	24	5½	5	2	109	Cellular	H. T.		Cone	Plan.	2	Ch's.	3	34x4	34x3½ D'l	Truck	2 Tons
PACKARD	$3,850	32	4½	5½	4	144	Tubular	L. T.	Storage	Ex. B'd.	Prog.	3	Ch's.	4	4	4 D'l.	Truck	3 Tons
KNOX—18	$4,300	50	5½	5½	4	154	Cellular	H. T.	Dry	Mul. Disc	Sel.	3	Ch's.	4	36x5	36x4 D'l.	Chassis	5 Tons
SAMPSON—4-9a	$4,500	40	5	5	4	134	Tubular	H. T.	Dry	Cone	Sel.	4	Ch's.	3	36x4½	36x4 D'l.	Truck	4 Tons
STUDEBAKER—2012	$4,500	2 Mot'rs	Elec	tric	..	126							Ch's.	..	36x7	36x4 D'l.	Truck	5 Tons
HEWITT	$5,000	28	4¼	4	4	138	Cellular	H. T.		Cone	Plan.	2	Ch's.	3	36x4 D'l.	36x5 D'l.	Truck	5 Tons
POPE-HARTFORD		30	4⅝	5⅛	4	130		H. T.	Storage	Cone	Sel.	3	Sh'ft.	4	34x5	34x5	Amb'l'ce	.....
POPE-HARTFORD		30	4⅝	5⅛	4	130		H. T.	Storage	Cone	Sel.	3	Sh'ft.	4	34x5	34x5	P. or Fire	.....
GENERAL VEH. CO		1 Motor	Elec	tric									Ch's.	..			Delivery	350 lbs.
GENERAL VEH. CO		1 Motor	Elec	tric									Ch's.	..			Delivery	½ Ton
GENERAL VEH. CO		1 Motor	Elec	tric									Ch's.	..			Delivery	1 Ton
GENERAL VEH. CO		1 Motor	Elec	tric									Ch's.	..			Truck	2 Tons
GENERAL VEH. CO		1 Motor	Elec	tric									Ch's.	..			Truck	3½ Tons
GENERAL VEH. CO		1 Motor	Elec	tric									Ch's.	..			Truck	5 Tons
CHAMPION		1 Motor	Elec	tric		80								..	36x3	36x3	Delivery	½ Ton

THE GENERAL SITUATION IN RELATION TO COMMERCIAL VEHICLES.

A cursory examination of the commercial vehicles at the Garden may lead to the hasty conclusion that the commercial situation is a relatively small compass. Let account be taken of the circumstances under which the commercials are compelled to labor, consider the fact that the exhibition is primarily one for the purpose of displaying pleasure vehicles, and the fact will dawn upon the mind of the observer that the commercials in this instance are merely as a tail to a kite. But if any one thinks the tail is lacking in length, then let it be understood that an indoor show of commercials is rather restricting, and also take heed of the fact that the display of commercials at the Garden is incidental to the "big show."

The commercial situation is vast in its spread and it covers a car for every purpose under the sun. The cars as above listed merely serve as an index of the situation in a general way. If a car is desired for any given purpose it is only necessary to make the want known, and a dozen companies will be able to show vehicles in actual service, doing the work in a manner to leave nothing to be desired. Nor does it matter if the service is something special, something to be considered for the first time; the same companies will give the details of the proposed service the benefit of their experience, and if it presents anything of practical value cars will be fitted out for the work, and the results will be all that reason will demand. Under the circumstances it will not be fair to judge of the extent of the commercial situation based upon the cars in the Garden show, or from the number of commercials as shown in the data sheet here afforded.

The reports emanating from responsible sources in relation to the performance of commercial cars has been very encouraging of late; the extent to which the business is expanding is far more comprehensive than most merchants realize and the old line of strictures will find no resting place in the literature of the day.

MECHANICAL ADVANCE OF THE INDUSTRY

By THOS. J. FAY.

SPACIOUS as the Garden is, and broad, the room is insufficient. The A. L. A. M. comes to town, heralded only by confidence in its ability to display automobiles the qualities of which are not to be spoken of in aught but glowing terms. Not that the cars look any better than the superior types of a time ago, dressed as they were in body work of a quality—if color counts—too good even to last; and there were those who were willing to proclaim a short life for some of them at any rate. If this is the year of the moderate price—and the evidence is at hand to make out a fairly good case—it is also the year of accentuated quality.

In other words, this is the year when all the cars have moved up to a higher level, although there probably is a relation between the respective cars that has not changed so much as one would like. The medium-priced cars as they will be seen at the Garden will represent good value indeed.

The time was, and it was not a long time ago, when all attention was paid to the body work, because the purchasers did not know how to judge of the quality of the machinery, and they thought they could tell a good looking body. The body work certainly did cover a multitude of very grievous sins in many cases, and it would not be wide of the mark to predict that the makers of some of the automobiles knew not so very much more, or they would not have had the nerve to show the cars, even if they were covered up by the bodies, which hid the machinery from the eye of any over-critical purchaser. In these little diversions there was little or no attempt at actual deception, since the builders of cars were doing quite well for the time; nor had the patrons, who stood the brunt of it, any great cause to complain.

It is always the privilege of the public at large to take the experiments of an industry, or an art, and by trying the plans out lend the product of their keen observation to the industry. On occasions, when the public is thus put to work—and made to pay the bill besides—they grumble, and it is not uncommon to hear them say that they are being imposed upon, and some of them go so far as to say they are being robbed. This is all nonsense, since it is necessary to experiment to be able to do things right, in time, and no matter how it is done, it is assured that the public must pay the score in the long run. This same public would have a right to complain were it not allowed to work besides. Of course it is nothing but work to try to make a car run, when, as a matter of fact, there is no run in it. Certainly the men who struggled with some of the automobiles of the past will not deny that the cars at the Garden are positively good!

What the Pioneer Buyer Can Observe.

Is it not now a great honor for any man to be able to say: "I paid good money for a car, and it was one of the first, the quality of which was so stubborn that it would not run, despite the price and the labor I lavished upon it"?

A pioneer who can say this can now go to the Garden, and he will get his money's worth in just a look at the automobiles that will run with the same steadiness as the reverse was true of the cars of not-so-long-ago. A pioneer, in such a position, has something to live for, and he can rest assured that the cars of to-day are the direct result of his bravery, and his blood and money.

It is a wide difference between an automobile in which the respective parts are related to each other in such a way that each will perform its respective part, and an automobile in which it is assured that fully five score of the parts are weak, and that the balance of the members have to struggle with the overload. There is all the difference possible between a car in which each one of the 2,400 parts is stressed in exact accord with its kinetic ability in such a way that they will all fag out at the same day and hour. It will be many a long day ere this will be so. The fact that automobiles look very much alike and have wheels that go around in very much the same way is small indication of the competence of them severally or collectively. There probably is not one absolutely right automobile in the world, and it will be no crime if the next century slips into oblivion without feasting its eyes on perfection by way of an automobile.

This search after kinetic perfection will be a long hunt; it will be up and down the highways and the byways of knowledge, and it will be a "still hunt." In the meantime it is pleasing to note that a certain practical perfection is present in the cars at the Garden, and the men who made the show a possibility should think kindly of the earlier patrons of the industry who paid the bill and kicked so hard about the shame of it. It was the kicks that did so much to advance the industry, and it was the men who paid attention to the kicks that are to be at the Garden with the finest display of cars that the A. L. A. M. ever mustered to the call of the patrons. The call is certain to be answered, too; the patrons are fearing a shortage in number of the cars which command respect.

It would be a fine thing if it were possible so to paint a picture of the situation that all would understand, and it would be possible were the painter of sufficient competence. It is not that the audience is obtuse; it is that the painter has not the skill. Depending, then, upon desire rather than upon skill, it will be to point out a few of the aims for perfection, and the inroads made, in so far as it will be possible to discern them.

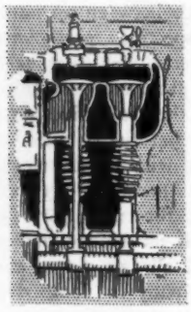
The Relation of Materials to Design.

It was long known that steel, and, in fine, all materials had life; that the life is long or short, depending upon the manner in which they are used. When automobiles first came into vogue it was soon learned that the service was of such a character as to "kill" the steel quickly, if the same was of the ordinary grades to be had for the asking in the marts of commerce. It was learned that materials would survive in service, long or short, depending upon the manner in which they were fashioned, and if the extreme fiber strain was maintained within certain relations.

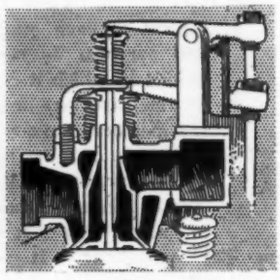
As the industry advanced it was a hunt for materials of a suitable quality on the one hand and a hunt after knowledge of their proper use on the other. Each increment of gain in the direction of better materials was met by an increment of gain of knowledge of their proper use. The result was a gain as the square, or, in accordance with the square law. Each combination of the increments of gain in quality of material, and of knowledge of the proper use of the same, was in

turn put through the same evolution, and the result is a "pyramid" made up of increments of knowledge of the use of materials and of gains in point of quality of same.

Simultaneously there was the elimination of the fallacies—of which there were carloads to spare in the earlier



E.M.F. Valves.



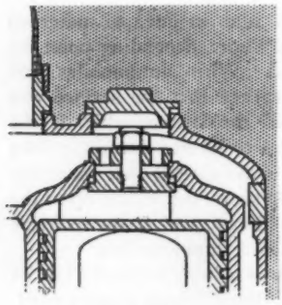
Franklin Valves.

days—and there are a few left. At all events, of fallacies the most bold have been set aside for use by some new industry; nor do they seem to be perishable property. Most of the fallacies came in as a result of the application of "the logic of events." Logic is said to be the chairman of the Ananias Club. Anyway, it is plain that a certain class of logic failed in the automobile business, just as it failed when Col. Sellers tried it on the "Orientals"; there were millions of them, but they were all of precisely the same density, and they all failed to see the point.

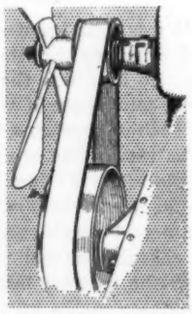
The A. L. A. M. Mechanical Branch.

It is just so with the materials; they failed to work on many occasions, possibly for the very reason that they were the logical conclusions. Equally there were a crop of designs that for result did but fittingly illustrate the application of what is sometimes called a zero equation. The A. L. A. M. must have foreseen much of this when the mechanical branch was organized, for in that act is to be seen an attempt to pyramid knowledge, to be accomplished by the discussion of current events, and the concise compilation of the facts resultant from the combined knowledge of the engineers of the several associated companies. The natural result was that materials were improved, and the proper use of the same followed.

In the cars at the show will be found the product of thus pyramiding the knowledge of men, and the materials



Pierce Cylinder.



Haynes Fan Belt.

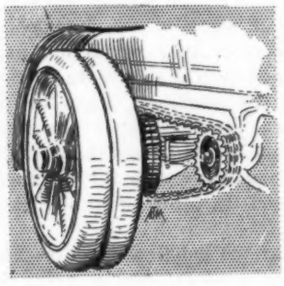
are far more capable than ever before. Even without the great improvements in materials it would be possible to foresee that great gains would be the result of thus combining effort, for then harmony in design is bound to follow, and this is a matter of far more importance than the improvements in the qualities that do, in materials, reside. It is possible to conclude that an harmonious design, even if the materials are bad, will result in a prolonged life, since, if harmony is a phenomenon, each part will bear its own burden and none will be destroyed in the process of doing its neighbor's work.

In a sense it is a great misfortune that materials cannot talk in a language that can be readily understood by men of ordinary skill and understanding. On the other hand, these same materials have a language of their own, and it is the business of the engineer to understand that language. It was one of the ideas of the Mechanical Branch of the A. L. A. M. to interpret the language of the materials used in automobiles, in order that, when the materials would complain of a killing burden, something would be done to relieve the situation.

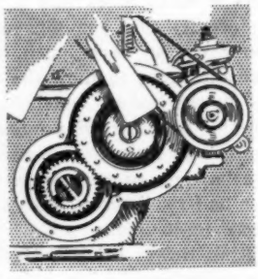
The Language that Materials Speak.

In this way the situation has been relieved to a vast extent and the cars so treated have advanced until it is a moral certainty that ten years of cut and try would not have done a quarter of the good, that is but the finished task of less than five years of pyramiding on the part of the designers of the cars as they are to be seen at the Garden. As it is to-day, the complaints of materials are comparatively few, and it happens to be the case that users of cars are stilled by the very process that rendered the burden fair.

Formerly it was the practice to consider that materials could be sized up on a basis of certain conventional physical



Silent Chain.



Chalmers Time Gears.

properties, as tensile strength, elastic limit, elongation and reduction of area. True, it was the practice to take into account the compressibility and one or two other phenomena under certain conditions, but the point to be made is, that it was a static basis of fact that received the most, if not all, the consideration, in nearly every case, to the entire neglect, one might say, of the life of the steel, or such other material as may be used on a basis of kinetic loading.

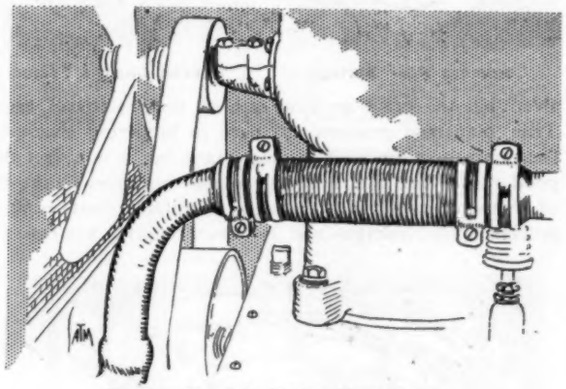
When the Mechanical Branch took hold of the matter it was at a time, just after independent investigators had conclusively shown that the American makers of automobiles were under a handicap, due to the use of inferior materials. It was slowly brought to the notice of the builders of cars that the foreigners had it largely their own way, due to the fact that the foreign steel makers were in the habit of co-operating with the users, on a basis to bring about the best result, while in America it was the practice of the steel makers to "hoot" for quantity and let the quality follow as best it might.

When the A. L. A. M. began to look into the matter it was quickly found that a laboratory was as necessary as the materials, and the diversity of thought that found expression had to be classified even to the extent of culling out much that may have been of abstract value, which could not, for certain reasons, be taken into account in

connection with automobile work. The laboratory was established, and that it was fairly well fitted out is apparent from the results attained in being able to talk to the materials, as it were, thereby to ascertain their wishes (ability), with a view of locating them in the places they might serve to the greatest advantage.

It was soon found that materials could not be used to advantage on a basis of the static tests, nor was it determined that the steel makers were so much interested in the quality of the material as they were in the price and in the quantity that they could get on order. It was a case of quantity taking precedence with them, and quality was at a low ebb. Having fitted out to be able to fix upon the qualities of the materials from the point of view of their kinetic ability, the next step was by way of culling out the materials that were so very inferior as not to be given consideration at all. From this point to the time when the laboratory was enabled to state with fair certainty what could be used in automobile work was at the expense of a long series of tests, and of uncertainties there were many, to be reduced only as the product of repeated tests.

When the materials that would serve the purpose were arrived at, then came the question of finding the mills that would furnish them. This may look like a simple matter, but it can scarcely be regarded as such in view of the experiences that followed attempts. That the mills



Haynes Flexible Water Hose Joint.

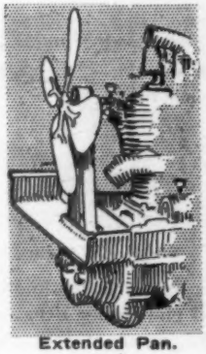
regarded themselves as the sole judge of quality is assured, and in a sense they were right, for in many cases the materials were so inferior that none but the fabricators could unravel the tangle.

Sending orders abroad was the only expedient for a time, and this was the process to bring the mills to a sense of the uselessness of trying to dam up the situation with materials not stout enough to accomplish the purpose. Once the makers of materials found that the foreigners were hungry for business, it was as an appetizer for them, and they did respond in a manner that prevented the whole business of furnishing automobile materials from falling into the hands of the mills in France, Germany, and England.

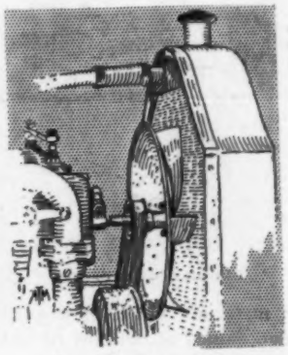
The Standardization of Parts.

With the question of the materials in a fair way to be disposed of—in time, at any rate—the next question was one in which an attempt was made to arrive at stadnards, more particularly in relation to parts, hoping that in time standards of units might be fixed upon as well. Certain of the drop forgings, and bolts and nuts were handled in this way, and the industry was benefited marvelously by the results of efforts along these lines. In relation to the standardization of units, it is enough to say the problem is formidable, and it may take even years to bring about anything like a standard. On the other hand, it was possible to establish a horsepower formula that did serve the purpose, in that it put all the motors of the same general type on a common footing, and enabled the makers of cars as well as the patrons of the industry to decide with more or less certainty as to the fairness of the ratings of motors and the power for weight of cars.

Then it will not be too much to say that the cars at the



Extended Pan.

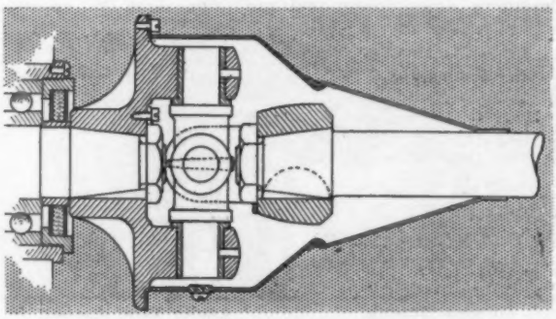


Fan-Blades on Shield.

show do represent, in a most substantial manner, all that has gone before, including the work of the mechanical branch, in the endeavor to arrive at a fitting standard of the materials used in the cars, and the way the parts should be whittled out for the work to be done. Purchasers will be enabled to see in the cars at the show all the concentrated effort of the designers, not only as individuals but collectively. As individuals, the designers were enabled to show the individuality which is never destroyed, even when it is lashed down to conventional standards born of experience.

The elimination of traces of the old buggy idea and the overhang in front was in process last year. There were evidences of short wheelbase to be disposed of, which in the earlier days indicated a desire to make the most of it, resulting in a cramped design, while the saving in cost was small, if such there was. In other words, it was difficult to cut loose from environs of the past, and it was not until the 1909 cars were put out that the up-to-date automobile was an assured fact.

As it is, the radiator starts at the front axle, and the body relates to the chassis in a manner to accord with the most approved ideas on the subject in all lands. In former times one could not be sure that the hood covered a motor at all, and even in cases in which the motor was under the hood it was frequently that the hood was far in excess of the needs. In a word, there was not the fine regard



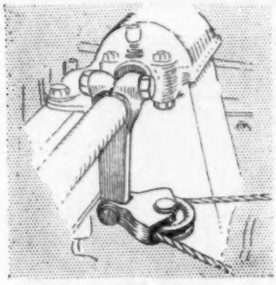
Grease Tight Pierce Universal Joint.

for truth and simplicity such as will be found in the cars at the Garden at the present time.

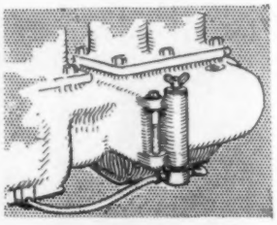
As respects the motors of the year, it is to note a grade of workmanship the quality of which is head and neck over the efforts of former times. Take the cylinders, for illustration; it matters not what may be the type, the

design is free from the minor errors which were once regarded as too trifling to be eliminated at the expense of a set of patterns, the cost of which is so great as to make short work of a five hundred dollar bill.

In the crankshafts will be not only the finest selections



Simplex Equalizer.



E.M.F. Oil Well.

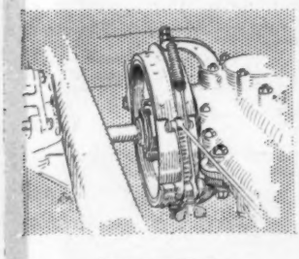
of materials, but designs quite in keeping with the knowledge gained at the cost of much skill and through the use of a well-equipped laboratory. Then, again, it is a fact that the fashioners of the forgings arose to the occasion, and the forgings were properly made for the service to be rendered, despite the fact that it cost thousands of dollars to fit out in a manner to be able to do the work.

In aluminum castings will be found a vast improvement over the work of even a year ago. To-day the castings are not only more in keeping with the shapes that lend strength, but the material is of far greater strength, which is not so important as the fact that the average strength is very much higher and the "wasters" are but few. It is never so much a question of the maximum possible strength of parts as it is the chances of some of them being below the safe limit. Aluminum was most uncertain in this respect, and it is in this direction that the greatest advances were made.

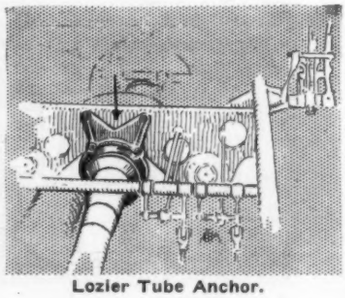
In the matter of noise, the improvements wrought represent a most noticeable difference, due to fine discriminations in design and the more perfect proportions of the valves, valve motion and relations, thus assuring the proper performance of the valves for the purpose, which is the matter of first importance. Fortunately, with the perfection of the valves, the noise disappeared.

Utilization of the Power.

If it is true that the motor work is on a basis of great stability, it is a fact as well that the clutch work is on a higher plane. The time was when it did look as if the clutch situation would fail to respond to the wiles of designers. Persistence and experience lent the necessary



Simplex Brakes.

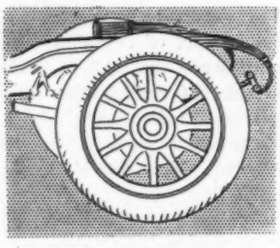


Lozier Tube Anchor.

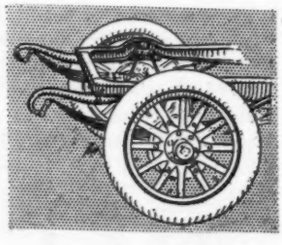
charms, and it is now assured that clutches will do the work in a manner to leave nothing to be taken for granted. In the earlier struggles it was thought that the types of clutches were most at fault, and changes were frequent. To-day it is recognized that all the types of clutches will work if they are properly designed. Some will take of skill more than others, but the skill is on tap.

Cardan shafts are now not only of the right kind of material, but they are designed in a manner to abort all tendencies to deform under the most severe conditions. If universal joints are used, they are on a fitting plane, and the means for attending to the lubrication is as adequate as the manner in which the "grit" is kept out of the joints. In the cases in which the power plant is on a basis of separate units, means are provided for the quick removal of any of the units, as the clutch or the gearset. It is also true that the motor can be lifted out of the chassis without having to remove the other parts. In many cases this is brought about by means of a suitable slip-joint, and in other cases it is a feature of the clutch. At all events, it is true that the units can be removed in the designs using separate units, while in the self-contained plants it is not necessary to consider the point.

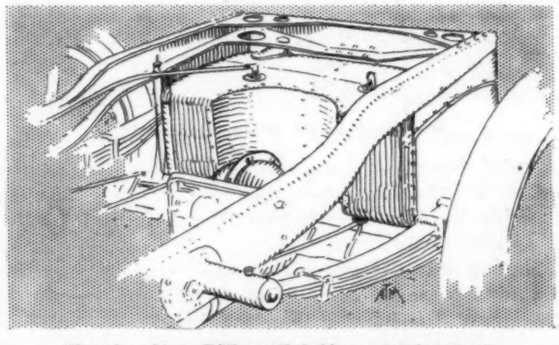
Transmission gearsets are on a high plane, some of which are of the "progressive" and one is "semi-progressive," but the great majority are of the "selective" types. True, planetary gearsets are used in numerous examples. Gears are of alloy steel in most cases, but it is a fact that good results are due in some notable instances to the use of "special steel" put through a suitable heat treating process. The linkages and the lever control systems are



Chalmers Rear Spring.



Curved Chassis Frame.



Showing How Differential Clears Lozier Tank.

in a high state of development, using special steel, of marked rigidity and die-forged. Left-hand control, by the way, is here in some force.

Brakes are of the kind that work, nor do they reduce to decrepitude as the result of sliding down a hill, as once they did. In many cases the brakes are all on the (rear) road wheels; the drums are of large diameter, the face is wide and the shoes are devised in a manner to assure long life, as well as the requisite ability. Facings for brakes are divers, as usual; some are metal to metal, more are "cork insert," and the new idea, using "asbestos" fabrics, is well represented. In brakes, too, the means for applying pressure are better, and the bearings are not now unduly pressed in the process of applying the brakes.

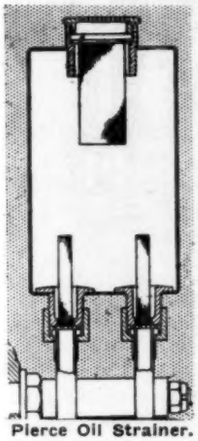
Springs, once the bane of the autoist, due in a large measure to lack of good design, together with the fact that the materials were good for certain purposes, among which automobiles cannot claim an assured relation. As

it is to-day, in view of advances in materials, and in the mode of heat treating, as well as the perfection of design, the spring situation is far advanced.

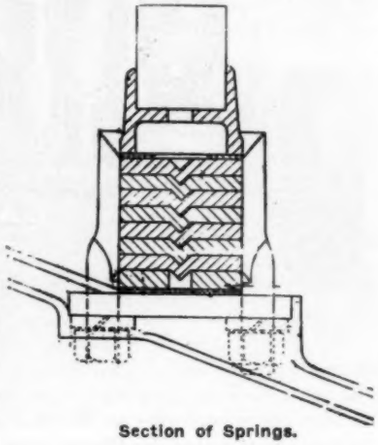
The Several Types of Motors Extant.

All but the "turbine" will be found at the show, displaying their respective advantages, under conditions to bring about a lucid exposé, in order to tell interested patrons just what the year has done by way of improvements. Any attempt at predicting the supremacy of the one over the other in the types of motors is as a waste of time, on the ground that all serve the purpose for which they were designed in a manner up to the needs of the occasion, and to the entire satisfaction of the adherents—nay, advocates of the generic types of motors.

The Air-Cooled Motor.—Air-cooling looked so reasonable and logical in the early days that the idea took root and prospered, despite the difficulties that beset the plan. It was known long before the automobile was taken seriously that air cooling could be maintained in connection with the motors if the bore of the cylinders was limited. On the other hand, it was then supposed that excess heat would beset the plan in any attempt to increase the bore, or gain in power in any other way if displacement was to be the basis. When the



Pierce Oil Strainer.

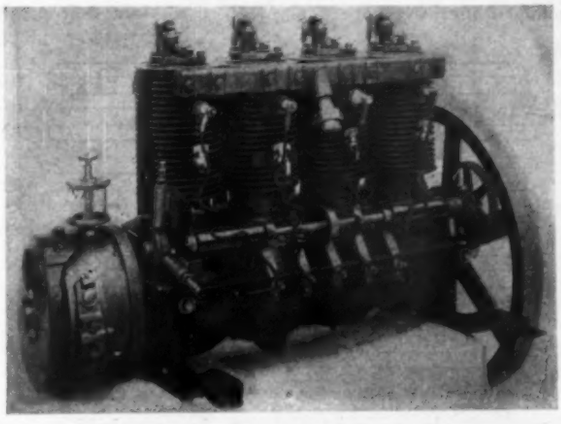


Section of Springs.

Franklin first came out the size of the motor was commented upon, in many cases unfavorably, since it was not quite in accord with the "untried" theories of the day. But the Franklin went about its business in a way to surprise the "natives," and despite the croaking of the theorists (?) it has been going ever since. As it is to-day, the Franklin company has a "six," and it ranks with the cars of the class, with never a thought of air cooling unless to point out that it works quite well enough to satisfy the school of autoists who deem an air-cooled motor suitable for their needs and who will take the ground that they do know what they want and act for themselves.

Certainly the autoist who does not take kindly to "plumbing" favors the air-cooled motor, and in the Winter time it is quite up to a fitting standard, while in the hottest Summer weather it does work so well that the builders of this class of cars depend largely for their business upon the very customers they dealt with from the start. In other words, the air-cooled motor has maintained itself under more or less hostile conditions, maligned for the most part by the men who always maintain that they would not be found dead in a car with a motor of the class. The question is, What do they know about it, if they decline to benefit by experience?

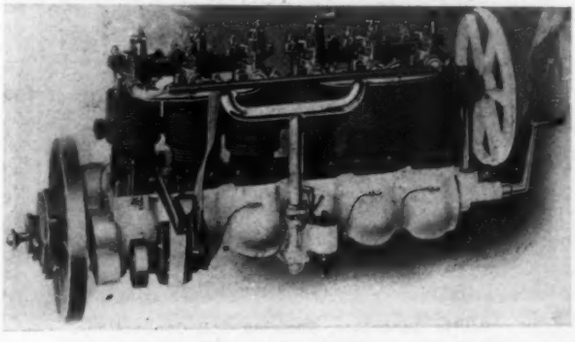
In recent times the air-cooled situation has gained in converts to a considerable extent, and in taxicab work in particular it has made a notable advance. Several companies now handle the air-cooled situation, and the industry has taken on an impetus that is a fair measure of



First Franklin Motor, without Auxiliary Valves.

the fact that it is here to stay. If the air-cooled motor has anything against it in its own sphere of activity, certainly the industry is slow to find it out. On the other hand, failures due to the lack of knowledge of the application of the principle cannot be charged to the successes that may now be seen at every hand. In recent times it may be said that a better appreciation of the fine points in design had much to do with the success of the motors of the type, and it has been admitted that the air-cooled motor requires skill to a degree not present in motor work in general.

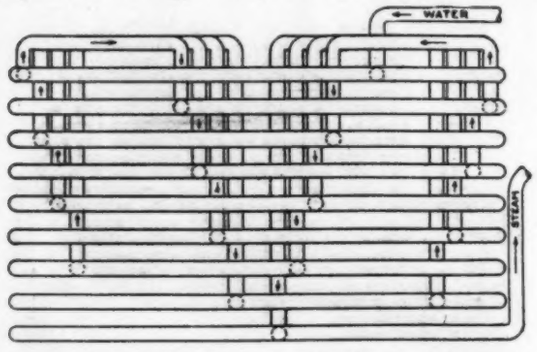
Stability of the Steam Car.—Flexibility is a word which when applied to the steam car situation loses none of its potency. Adaptability, therefore, is a natural sequence, and desirability is portrayed in the very strength that enables the steam car makers to maintain a certain supremacy, despite environment. Force of numbers is oftentimes the main strength that beats against a more or less righteous minority, and as water will wear away the hardest stone, so will quality be swallowed up in the meshes that surround it. Taking all the circumstances into account, it is to reach the conclusion that the steam car situation is one of masterly strength despite the limits imposed.



Late Type Franklin Motor, with Concentric Valves.

To begin with, a steam car is nothing if the steam generator is not of the greatest efficiency and of a character so stable as to leave absolutely no problem unsolved, if the same is in relation to safety. The White generator is illustrated, and to more clearly depict the points of

merit a diagram of the generator is also given. The generator is made up of a series of coils of steel tubing, superimposed and connected in succession. In other words, were the coils to be straightened out the whole would be as a long length of steel tubing. In operation, water is pumped into the upper coil, and steam issues from the



Section White Generator, Showing Water Circulation.

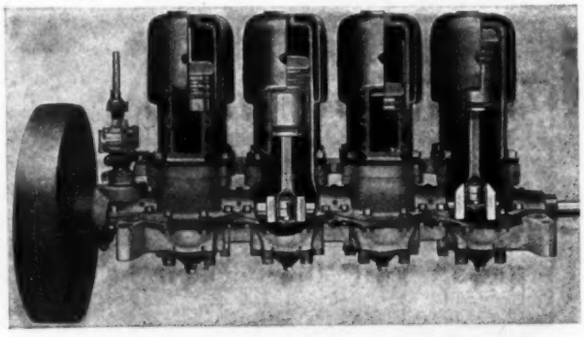
lower coil. In a word, the water does not hold as such throughout the length of the coil, and the amount of water in the coils at any one time is less than the amount, which, if all were elevated to the steam state of aggregation, and raised to the highest possible pressure consistent with the means afforded, there would not be enough water in the system to generate the requisite pressure to damage the generator, much less to cause the slightest departure from feather bed safety. The White system, then, does not take into account a large amount of water in a boiler, under pressure, and prone to flash into steam, thus chancing an explosion. The long length of steel tubing, about 1-2 inch in diameter, is there for the purpose of making steam as the same is wanted, and the means afforded for the proper regulation of the influx of water represents, in all truth, the mode of control.

The Two-Stroke-Cycle Motor.—This type of motor can be either air or water cooled, allowing that the designer is capable of coping with the several problems at the one time. However, it is not usually the case that two-stroke-cycle motors are air cooled as well. As a rule, it is the idea to favor the two-stroke-cycle motor to the greatest possible extent along lines in which the question of scavenging is considered to be the matter of the first importance. Taking the 1909 automobiles for it, there is ample evidence

White Generator, Showing Coil Connections.

of the fact that the two-stroke-cycle motor is gaining converts among the autoists who do not care for valves, the requisite motions, and the chances that go with them by way of leakage. In the earlier attempts to build motors of this class it was made apparent that flexibility would be a little difficult of attainment, for reasons that were variously stated at the time. It may come as a surprise to many, then, to learn that in the motors of the class the question of flexibility is settled in favor of what may be well termed a fine performance in this respect.

The motors of this class promise much in commercial work in which the class of labor is not of the mechanical turn of mind, and of mechanical things complication is the least to be desired. In any zone of activity the least of two evils is the one to choose, and simplicity is the first requisite in commercial work. As yet the motor of this class has not been used to any great extent in buggy service, but it should have a demand in this direction if it is a fact that this is the service in which there is the greatest need of simple devices. Certainly it is true that the two-stroke-cycle motor is simple. Of this class of motors it is too soon to say which of its subdivisions will ultimately prove to be of the greatest advantage. As is well understood, the three-port motor is even free from the complication which comes from having to use a valve in the crankcase, and in this way the motor becomes truly "valveless." In the two-port type the valve is an "automatic," and its function is to entrap the mixture after it is sucked into the crankcase. On the whole, taking all things into account, the Elmore has maintained a standard of excel-



Elmore Two-Stroke Cycle Motor, Shown in Section.

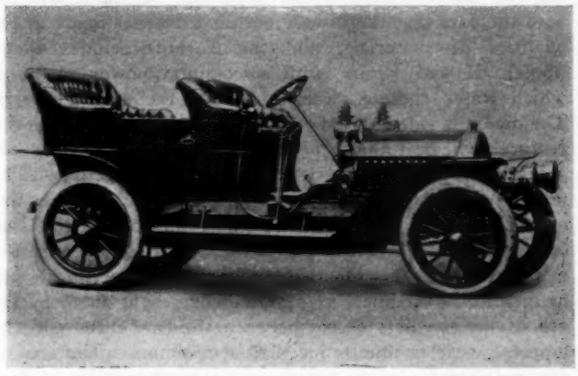
lence, using the well-known Elmore two-cycle motor, and the only complaint ever made was that the company failed to turn out enough cars to fill the demand. This is in the face of the fact that the Elmore plant is pretentious.

Trend of the Water-Cooled Motor.—This is mostly a question of the location of the valves. The T shape was regarded as standard until very recently, but it is now a question if the T shape has maintained the supremacy which it promised. In many cases there are splendid types of the L shape, in which the advantage of a single camshaft is displayed; then there are motors in which the valves are in the head, using a superimposed camshaft. The Knight motor was of America, but it emigrated, and is now to be exploited in this country by the British Daimler Co., and in it will be found a variation of the water-cooled type of motor in which valves are used, although it is true that the Knight motor was once regarded as valveless. In this connection, it may as well be said that the valves are there, by way of sleeves, instead of the conventional "poppets," and the future will tell if the plan is superior.

What of the Gas Turbine for Automobiles?—Completeness demands mention of the gas turbine, even if it is true that the Garden will have none of the type. That the turbine is possible is now becoming more apparent, and, just to be up to date, it will be the idea to call attention to the fact that experimenters are figuring upon the introduction of the type. But it cannot be stated that the "turbine" will be in much evidence for many years to come.

ILLUSTRATED WORD PICTURE OF THE CARS

AUTOCAR: The Autocar Co., Ardmore, Pa.—By way of pleasure cars this well known company will exhibit at the Garden its model known as Type XX, which is a four-cylinder car of the latest and most approved design, in which the ignition is with a Bosch magneto, and the transmission is of the progressive three-speed type. The wheelbase is 102 inches, and the wheels, of a very comprehensive design, are fitted with 34x3 1-2-inch pneumatics. The baby tonneau on the model at the show is well inclined toward the zone most fittingly referred to as "finality," and on the whole it is easy to account for the interest that will center around the exhibition of the Autocar. In addition to the chassis as above described, the exhibition is most complete in other ways, and it includes bodywork as follows: A landaulet which will be found of splendid proportions and artistic in the extreme; a town car design, and a taxicab, as well as a victoria. Especial mention will be made of the fine appearance of the last-named body, in view of the high art depicted in its graceful lines. The whole exhibition of the Autocar, taking it collectively, renders it easy to reach the conclusion that the company is alive to the 1909 needs from the autoist's point of view, and to meet them

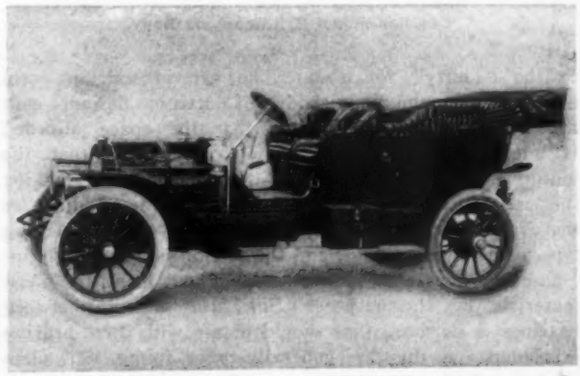


Autocar, 18-20-Horsepower, with Touring Body.

constitutes the sole ambition of the company. The mechanical work on the chassis and all its parts is well up to the high standard of workmanship which has always characterized the output from Ardmore.

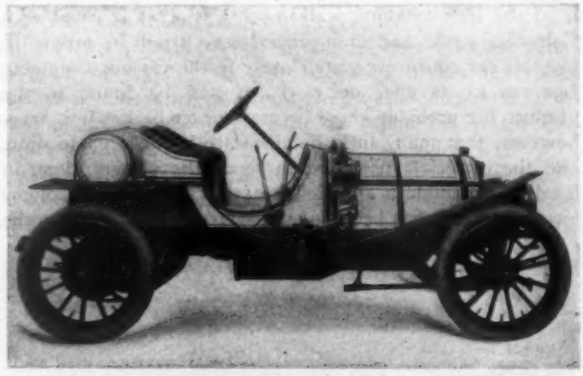
APPERSON: Apperson Bros., Kokomo, Ind.—The "Jack Rabbit," good for 75 miles per hour, from the Apperson borough, is a four-cylinder car rated at 50 horsepower. "Big Dick" belongs to the same family and is intended for the autoist who wants to go 90 miles per hour. This car also has a four-cylinder motor and is fitted with a runabout body. As a general proposition, it is likely that the Model O Apperson is the car which the average autoist will be the most interested in. The Model O is a 30-horsepower touring car, of the latest and most approved make, fitted out in a manner consistent with the advances in the art. This car is of the four-cylinder class, and among other special features are I-section vanadium steel front axles and a floating type of rear axle, so designed as to allow of the utilization of "plumb spoke" rear road wheels. The transmission gearset has special features, among which attention will be called to the absence of joints. The case is of aluminium and in one piece. The bearings are of the "two row" ball type, and it is interesting to note that the camshaft can be withdrawn from its nest in the motor case. Noiseless performance is one of the claims of the Apperson.

CADILLAC: Cadillac Motor Car Co., Detroit.—From the single-cylinder Cadillac to the four-cylinder proposition for 1909 is a great distance, and yet the single-cylinder car has a wide field of usefulness and is the favorite of very many autoists. The new "Thirty," however, represents automobile value as it will probably remain for some time to come, on the ground that the price, $1,400, for the car is a proposition in which



Apperson, Model O, 30-Horsepower Touring Car.

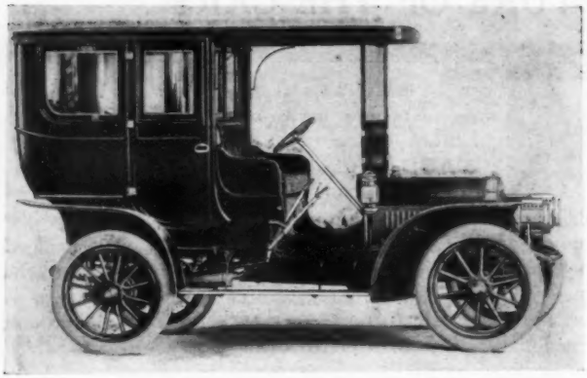
merit has a permanent residence. The four-cylinder "Thirty," like all Cadillac motors, is with certain special features such as have long been regarded as Cadillac earmarks. The cylinders are "individual," and the water jackets are copper, so securely put into place as to defeat any trouble from this source. The method is a guarantee of even walls of the cast gray iron cylinders proper, and, as would be natural to the method, the cylinders may be critically inspected all over. The Cadillac "Thirty" is a great big, full-fledged automobile, of fine appearance, but this is a fact that a mere inspection at the show will ade-



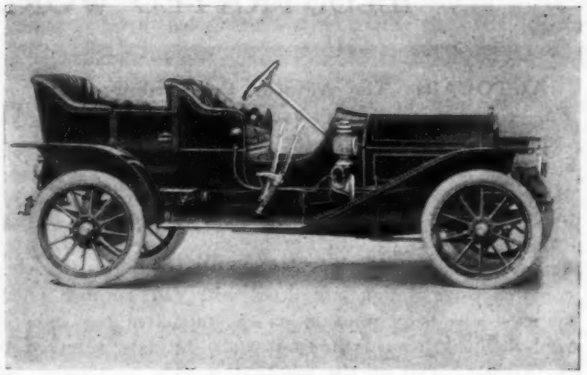
Apperson "Jack Rabbit" 50-55-Horsepower.

quately settle. The power is there, and the parts are accurately made. The castings and all the work, as well as all the other parts, even including the radiator, carbureter, etc., are made in the Cadillac plant under the supervision of the company.

CHALMERS - DETROIT: Chalmers - Detroit Motor Co., Detroit.—The 40-horsepower car of this make is so well known as not to require further mention, but it will be well to especially call attention



Cadillac Model G, Limousine Body.



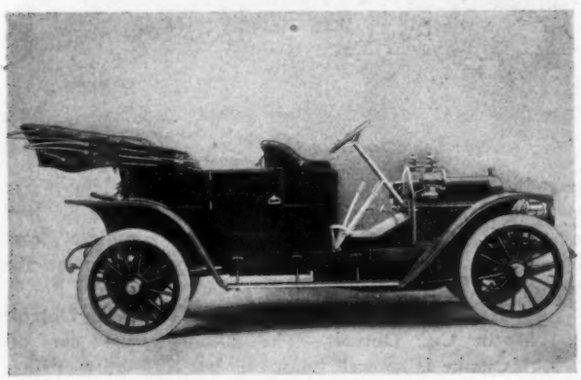
Cadillac "Thirty" Demi-Tonneau.

to the "Thirty" for 1909. The car in touring form is with a commodious body of artistic design, with the wheelbase 110 inches, so that the space afforded is adequate, especially in view of the fact that the motor is with cylinders cast "en bloc," thus making the motor very short and in this way adding to the available space. The crankshaft is of the ball-bearing type, using two bearings, and the section is accordingly increased to handle the strains, not without using the finest materials for the purpose. Since the distance between bearings is no more than would obtain with three bearing crankshafts as they are generally to be found, it is plain that the elimination of the extra bearing is to no disadvantage, if indeed, it may not react in favor under the conditions in which the car of the subject was brought to a successful issue. In this car the transmission system is of the selective, three-speed type, with a position finder that does the work without any chance of fumbling. The oiling system is very nicely worked out, and a "tell-tale" affords all the information required to enable the operator to feel sure that all the bearings are profusely lubricated. The car is a shaft drive, and the workmanship throughout is up to a high standard.

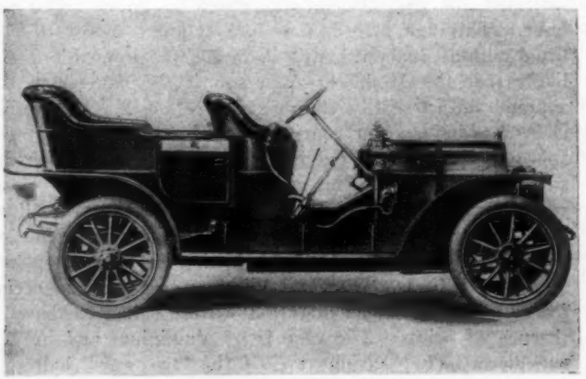
COLUMBIA: Electric Vehicle Co., Hartford, Conn.—The 1909 offering of this well-known company includes a gasoline automobile, known as Mark LXVII. This car is of the four-cylinder, water-cooled type, as is usual with Columbia work, and in a general way it will be proper to say this car conforms quite closely to the various Columbia features in its gasoline work, as will be found in the product for probably three or more years back. It is true, however, that many little details were brought up to date, and the materials used are those of the present time, in the light of modern knowledge of the subject. In Columbia work much has been done by way of standardizing the units of construction, and the chassis, for illustration, is of uniform dimensions in all the cars as turned out. All the types of bodies are therefore alike in the essential dimensions, and in all particulars the parts conform closely to a fixed standard. The motor is equipped with Bosch magneto; Hess-Bright ball bearings are used in every place requiring ball or roller bearings, and all along the line the same high quality of materials will be found.

CORBIN: Corbin Motor Vehicle Corp., New Britain, Conn.—Departure from previous design is by way of such refinements as experience dictates, coupled with the fact that there were certain advances made in the qualities of materials, and the Corbin includes them. Models K and R are with a common power plant, in which water cooling is used, as was the case formerly. The motor is rated at 32 horsepower, and among the special features will be found a nice arrangement of the camshaft gears, and the housing is complete and effective. The interior of the crankcase is accessible, and the valves are nested in a very simple and desirable way on the left side of the motor, where are also the auxiliaries. Among the Corbin features that identify the line from the "flock" will be mentioned the silent valve motion, brought about by the use of intermediate levers between the cam-faces and the tappets; wear is thus reduced to a minimum. The chassis frame is reinforced to assure entire freedom from deflections, and the flywheel is housed in by a suitable contour of the crankcase. The front axle is of the design in which a pivot bearing is used on the knuckles and the front connection of the steering linkage is to the back of the axle. One more point lies in the fact that the propeller-shaft is fully enclosed, joints suitably lubriacted.

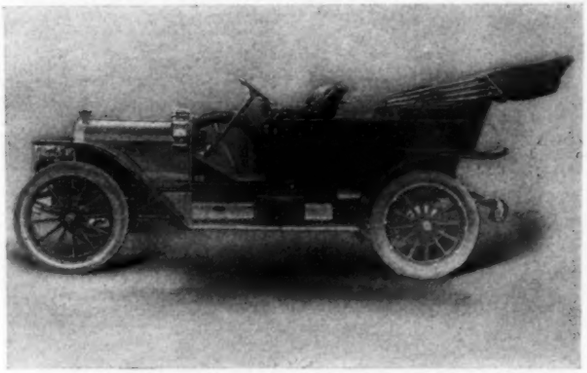
ELMORE: Elmore Mfg. Co., Clyde, O.—The two models for 1909 are known in the trade as Model 33 and Model 44. Model 33 is with three cylinders, while Model



Chalmers-Detroit "30" Touring Car.



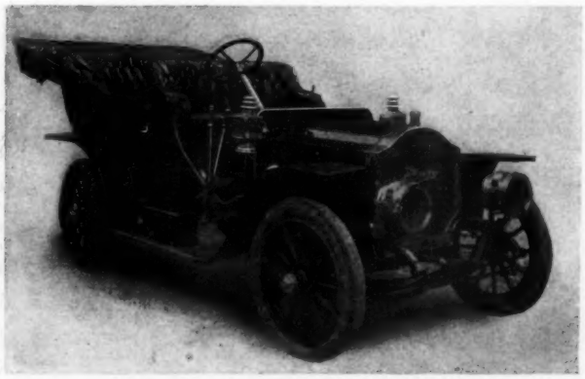
Chalmers-Detroit "40" Touring Car.



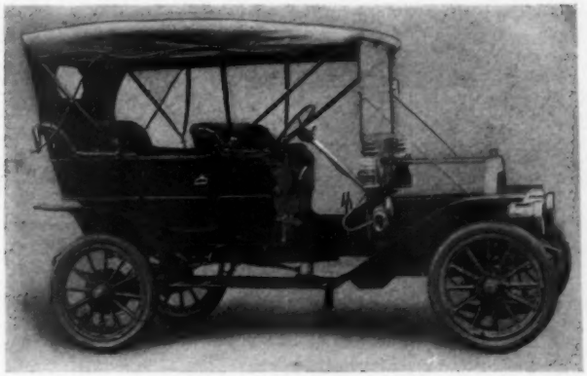
Corbin Model R, 32-Horsepower.

44 has four cylinders, and the motors of both are of the two-stroke-cycle genera. This is an Elmore feature, and great stress is laid on the fact that with the two-stroke-cycle valves are eliminated and a noiseless performance is assured. Then, again, there is the absence of valve grinding to be taken into account; moreover, the Elmore designers point out that leaky valves do more to reduce compression and, in consequence, power than any other feature in any type of motor. In these cars the crankshaft is offset, and in many ways the line has been amplified. The Atwater-Kent ignition system is used, and this is brought about through the use of a countershaft just back of the flywheel, instead of at the side, as in the 1908 models. The tonneau on both models has been lengthened, and the quality of the work in the body conforms to the high character of the workmanship in the chassis.

E.-M.-F.: Everett-Metzer-Flanders Co., Detroit.—The valves in the motor of the "Thirty" are 2 1-8 inches in diameter and the cylinders are 4 inches, so that the valves are over half the diameter of the cylinders, and thus will it be known that in the motors of this make the valves are very large indeed. At $1,250 this "Thirty" is one of the surprises of the year, particularly if account is taken of the fact that it is in every way a standard tour-car, both in point of size and in utility, fitted with every device known to the art, even including a magneto in the ignition system. The rear axle is of the type in which an expanded tube is used instead of castings and drawn steel tubing, and the ground clearance is adequate, in view of the fact that the bulge is not so great as was formerly the case in older types of live rear axles using ponderous castings for the purpose. The front axle is of the I-section of a fine grade of steel, die forged in one piece, and the turning radius is adequate, notwithstanding the fact that the designers were enabled to eliminate the "narrowing" of the chassis frame. The rear springs are of the elliptical



Elmore Model 33 Touring Car.

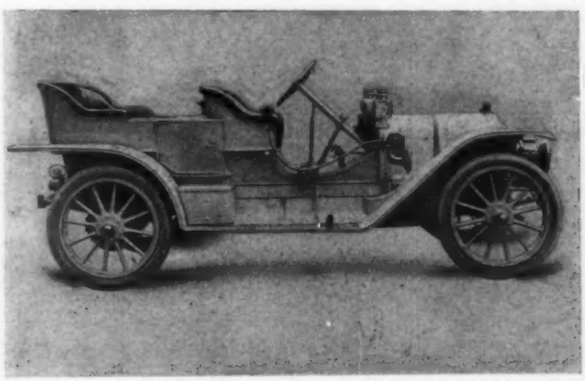


E-M-F Model 30 Touring Car.

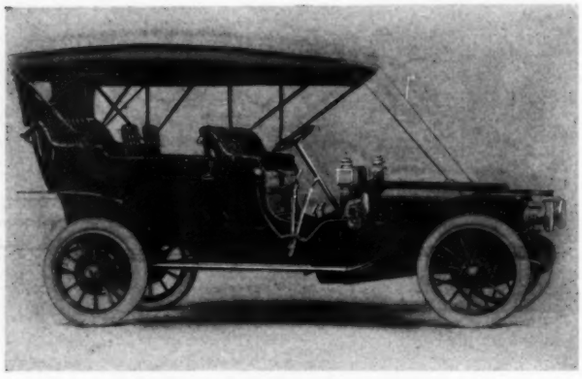
(scroll) type, and the easy riding qualities resulting are as good as the fact that the springs are free from breakage, even under conditions involving considerable road inequalities. The cars will be well examined at the show, for the public has pricked up its ears.

FRANKLIN: H. H. Franklin Co., Syracuse, N. Y.—It was in 1892 that the Franklin company made its first venture, placing upon the market a 7-horsepower air-cooled car. From that day to this the Franklin has been at it hammer and tongs, so to speak, with never a thought of departing from the air-cooled proposition. For 1909 the company will be mostly confined to the delivery of three models, as follows: G-4, D-4, and H-6. In the "six," which is Model H-6, will be found all the concentrated experience of the Franklin staff, and among other details of note is the fact that the car is very light, yet withal it is strong. The 42-horsepower motor is therefore not overworked, and the power for speed is in that relation which counts for hill climbing ability or speed, at the dictates of the owner. This year the engine governor will not be used on Franklin models, but the ignition system includes the "Bosch" magneto. The crankshaft work in this make of cars is along lines far more secure than formerly did obtain in cars in general, due to the advances made in the art and the fact that the company is now in a position to command particularly good material, which, coupled with the Franklin process, aided by suitable dimensions, lends enormously to the stiffness of the product. To show something of the extent to which Franklin cars are looked after in point of detail, it is only necessary to say the valve springs are made of vanadium steel. The concentric valve motion has proven to be quite as competent as the designer predicted.

HAYNES: Haynes Auto Co., Kokomo, Ind.—Model X-4 is a 36-horsepower car, and it is a good representative of Haynes activities. Illustrative of the characteristics in



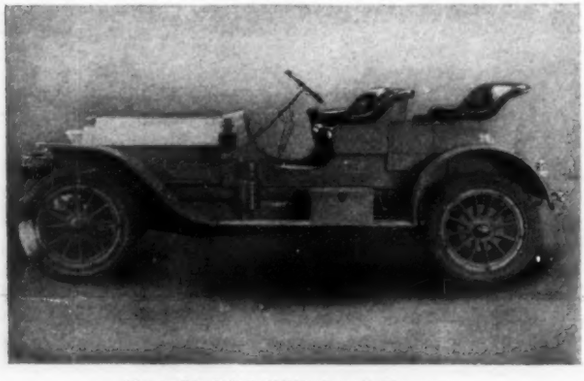
Haynes Model X, 36-Horsepower.



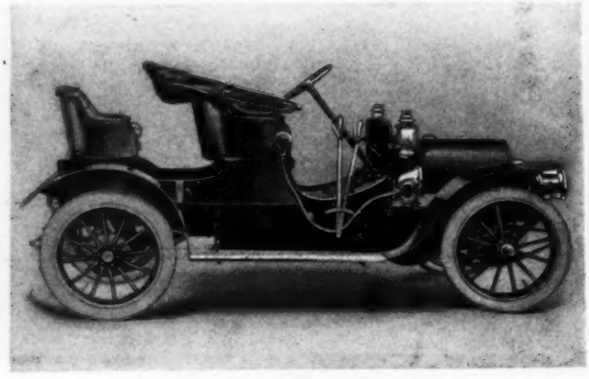
Franklin Model H, 43-Horsepower.

the products of this make is the crankshaft, the ends of which are carried on double sets of conical roller bearings, thus allowing for adjustment. The valves of the motor are located on one side, and all valves are of the same size, namely, 2 5-8 inches in diameter. In the wrist pins of the motor the bronze bushings are adjustable, and the general plan of the design takes into account the need for means by which adjustments can be readily made by one of no great skill. The clutch in the Haynes is of the contracting-band type, and in action is not unlike a conventional brake. The chassis frame is of more than the usual merit, owing to the use of a channel section reinforced by a special heat-treated vanadium steel member at the point of greatest strain. In the transmission gearset there is one principle that counts for safety and long life. This is by way of a ratchet drive on the master gear of the second shaft, so arranged as to prevent the operator from throwing the momentum of the car on the same in the act of starting or in the acceleration of the car. In divers ways the Haynes is a car of the most advanced construction.

KNOX: Knox Automobile Co., Springfield, Mass.—Model O is rated at 38-horsepower, and as a touring car sells at $3,000, which in all respects looks like a whole lot of car for the money. In this car it will be remembered that the cylinder heads are cast separate, and in this way it becomes possible to finish the cylinders with a precision difficult to duplicate. In several ways the idea indicates advancement over the former Knox models, and on the whole the cars of this make for 1909 should attract much attention. In the motor the valves are actuated by means of a single camshaft, and the valve motion is one of the advances of the year. This year the clutch is of the three-plate variety and is enclosed within the flywheel. In the sliding gear of the selective genera, two sliding trains are used, one of which affords direct on the high, then inter-



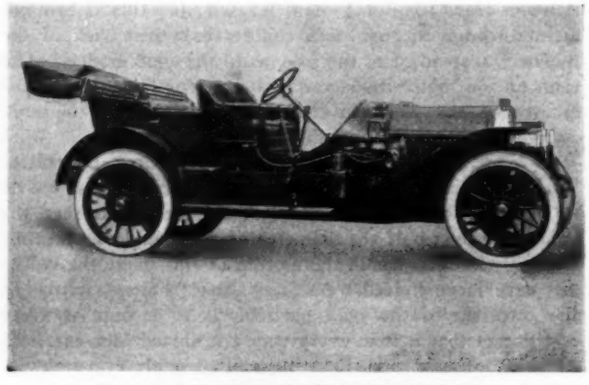
Knox Model O With Small Tonneau.



Franklin Model G, 18-Horsepower.

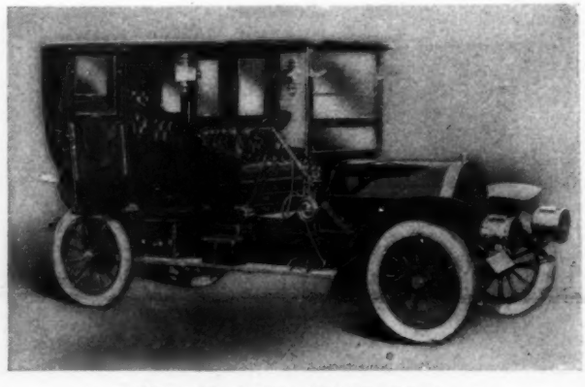
mediate, and the second is for low speed and reverse. As respects materials used in this make of cars, they are well indicated in the use of chrome nickel steel in the gears.

LOCOMOBILE: Locomobile Co. of America, Bridgeport, Conn.—The new shaft drive car of this company's make is the offering by way of the greatest advance in the line of cars the company produces. In this car the distance rods are situated as they are in the Locomobile side-chain drives and parallelism is thus main-

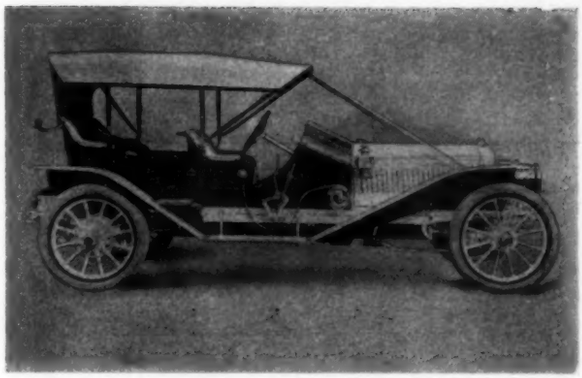


Locomobile Model 30 With Shaft Drive.

tained; these distance rods carry the brakes, and their rear ends are free to turn on the axle tube. The spring perches are also free to rotate within limits, and in these and several other ways flexibility is gained and road inequalities are not so prone to deteriorate the elements in the makeup of the car, which is a matter of the greatest importance, and, in fact, the great main reason why the shaft drive car was formerly regarded as more suitable for slow speed and low power. As it is, the 30-horsepower



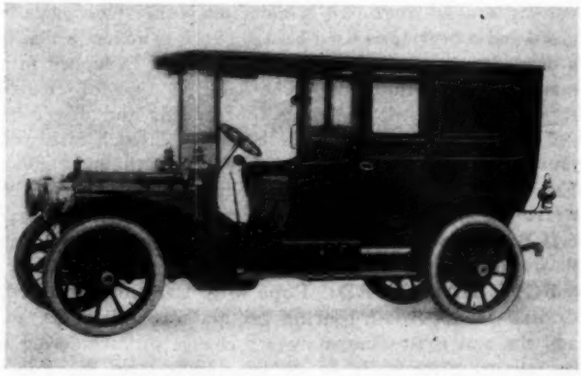
Knox Limousine, 38-Horsepower.



Lozier Briarcliff, 45-Horsepower.

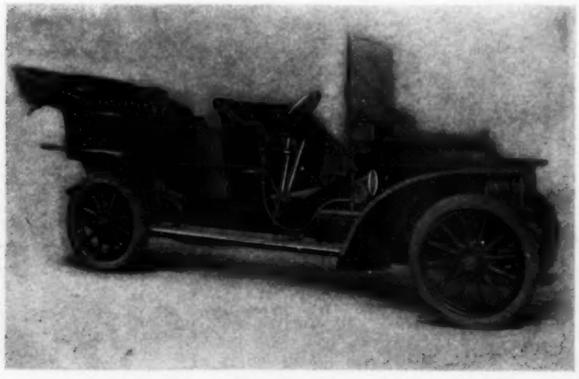
shaft drive Locomobile represents a very modern and up-to-date shaft drive automobile.

LOZIER: Lozier Motor Co., New York City.—Chain-driven cars will not be in the Lozier line during the year 1909, and by way of shaft-driven cars the Model H will be a good proposition to look at. Then, there is the Model I, which is a 50-horsepower four-cylinder car; nor should the "big six" be overlooked. In the Lozier line it is the claim that the gears and other important parts are

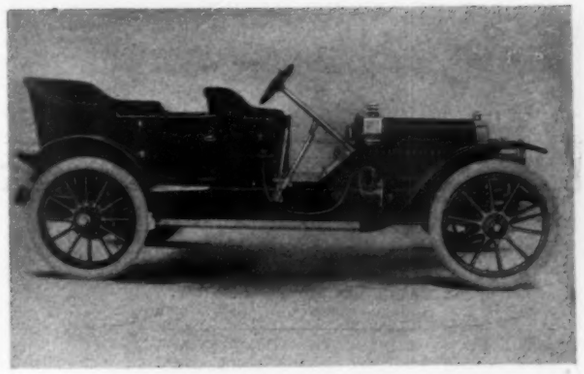


Packard Model 30 With Limousine Body.

made of a fine line of alloy steel, and the cars are very simple in all respects, due in a large measure to the elimination of parts such as torsion rods, universal joints, etc. The front steering knuckles are now fitted with ball-bearings, and in this way the effort for steering is reduced to the nominal. The cylinders of the "six" are 4 5-8 by 5 1-2, and the rating is 51 horsepower, which is of course conservative. In body work the "Briarcliff" is with very low seats, and the effect is as handsome as the result is



Matheson Model E, 40-Horsepower.

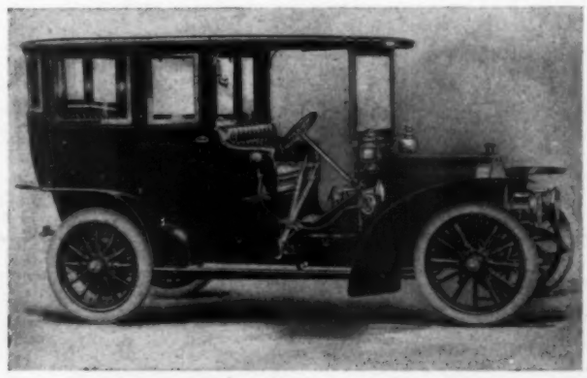


Lozier Little Six, 33-Horsepower.

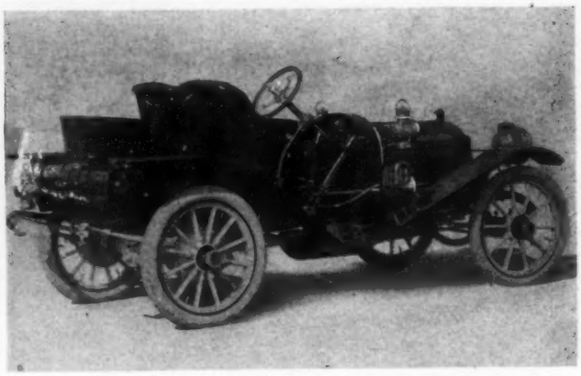
good. In endurance tests on many occasions the Lozier cars demonstrated their worth.

MATHESON: Matheson Motor Car Co., Wilkes-Barre, Pa.—Near "Giant's Despair," the hill that has proven the downfall of many a car of pretensions, the company naturally has the finest testing road in the country on which to try out the cars as they come from the works. Model E of the line is a 40-horsepower car, and in touring work it is regarded as quite up to a fitting standard. In this car the valves are in the head, all of the same size, and mechanically operated. The upper half of the crankcase is cast with a solid web between the supporting arms, thus lending adequate support to the motor; the lower half holds the oil used in the auxiliary splash, which does not prevent the "wick" system from working. The company lays stress on the fact that the gasoline in the tank is at no time under pressure; the arrangement is of such a character that the supply is regulated by the motor. When the motor stops, so does the gasoline. The car is fitted with hill-pawls and suitable means for controlling. As respects brakes, the cars are well provided; two of the brakes are constriction asbestos-lined bands on drums attached to the differential, and two are internal expanding on the rear road wheels, which brakes have shoes made of Parsons manganese bronze.

PACKARD: Packard Motor Car Co., Detroit.—The interesting car of the year from this well and favorably known plant is the four-cylinder 18-horsepower touring car. The price of this car is $3,200, and it is also used in connection with "town car" service. In general, the car is like the well-known "Thirty," but just enough smaller to make a desirable proposition in cases in which a big car may not quite suit the work. The chassis is standardized, and body work can be in many of the well-known designs. The mechanical features are of the most approved



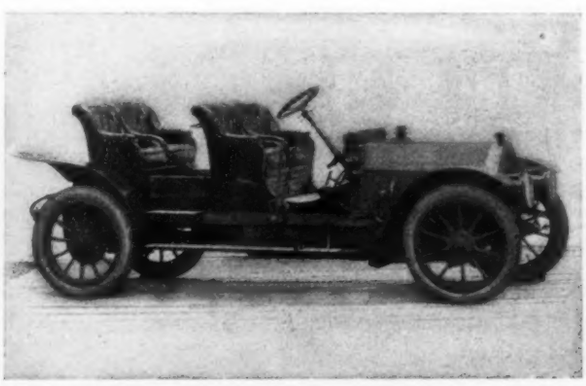
Matheson Model E With Limousine Body.



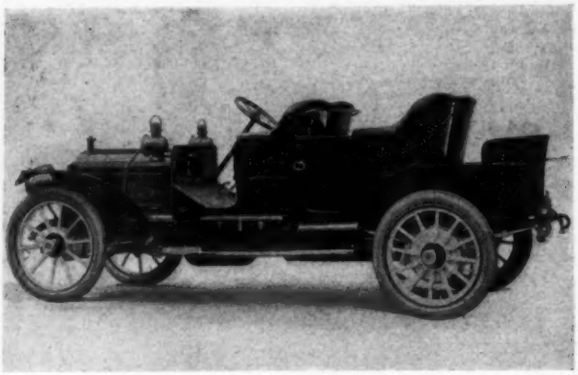
Packard Model 18 With Runabout Body.

"Packard" practices, among which may be mentioned the motor speed regulation, which is brought about by a governor in conjunction with the water circulation system. The speed changing gears and the bevel drive in conjunction with the differential are contained within a suitable aluminum housing, forming a rear axle unit. The gearset is of the "progressive" order, and the manner in which the changes are made is that usual to Packard practice. In connection with water pump there is a hydraulic pressure arrangement, by means of which the thrust bearing is lubricated, and in many ways the mechanical work is of an advanced order. In addition to the "Eighteen" there are the usual Packard choices besides.

PEERLESS: Peerless Motor Car Co., Cleveland, O.—Model 19 is a 30-horsepower car, with four cylinders, and, as the price indicates, it is a thoroughly up-to-date automobile, with every modern improvement of any value in this service. The car sells for $4,300, equipped for touring, and few indeed are the cars that have made a better showing of friends. In general, this car is not unlike the Peerless for last year, yet at the same time such refinements as the year afforded were incorporated into the model. In the refining process there is a point beyond which it is extremely difficult to go, and it would seem as if the Peerless has about arrived at that point in this car. By way of meeting the few differences to be considered, the wheelbase has been lengthened, and the weight distribution has been brought into a more harmonious relation. The shaft drive is on a basis to abort shock tendencies, and improvements in the universal joints have been effected. The new water pump on the motor is of the herring-bone type, and its noiseless performance is an added feature. The oiling system includes a compartment in the crankcase, the capacity of which is over a gallon of oil, and the means of distributing the oil are effective.



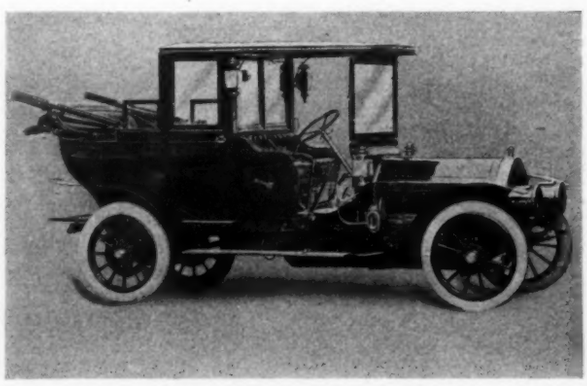
Pierce-Arrow 36-Horsepower Runabout.



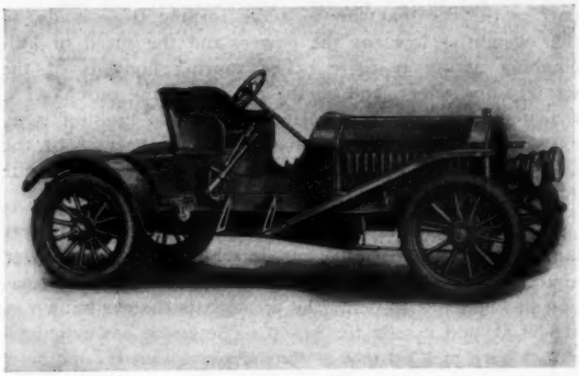
Packard 30 With Close Coupled Body.

PIERCE ARROW: Geo. N. Pierce Co., Buffalo, N. Y.—With one model of the four-cylinder type and three models using six-cylinder motors, the Pierce line for 1909 is well diversified. The four-cylinder car is rated at 24-horsepower, and sells at $3,500, while the bix six of the line is rated at 60 horsepower and sells at $6,000. In body work there is the usual diversion, and it is possible to get an "Arrow" in any of the usual selections of body work along lines consistent with the most modern practice, involving artistic work. In cylinder work the "twin" idea is used, and a bearing is used between each cylinder, which is a new idea in motor work; the castings are fashioned in a manner to suit the ends. The selective type of change speed gear is used, involving four speeds and direct on the high. The clutch is of the cone type in each case, and universal joints are used where they will do the most good. Engine valves are a little larger than formerly, and on the whole the models represent the refinements that the year fell heir to without a loss of former value. The Pierce line well deserves its great popularity.

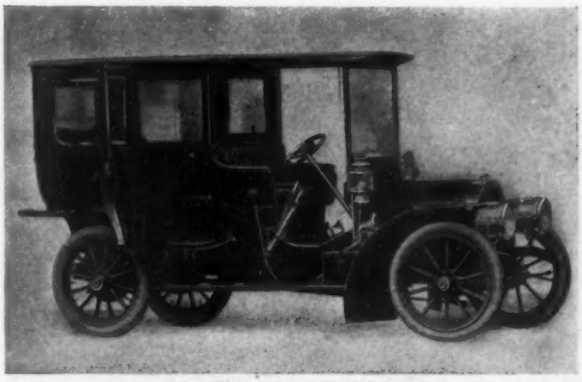
POPE-HARTFORD: Pope Mfg. Car Co., Hartford, Conn.—Model S is a touring car made to sell at $2,750, and the aim is to eliminate every chance of considering a car at any price more of an automobile than the Pope-Hartford at the price named. To be able to make good, the company has gone over the whole proposition in the most careful and systematic manner, with the result that the units in the car were revised in such way as experience dictated, in view of previous practice. As a result, the clutch has a little wider face, the rear axle has been somewhat redesigned, the brakes have been increased in size, the chassis frame has been redesigned to include a better distribution of the load, and a goose-neck rear spring hanger is included. The new body, with its straight line effect, is well worth a trip to the Garden to have a look



Pierce-Arrow Six-Cylinder Landaulet.



Peerless Roadster, 30-Horsepower.



Peerless Limousine, 57-Horsepower.

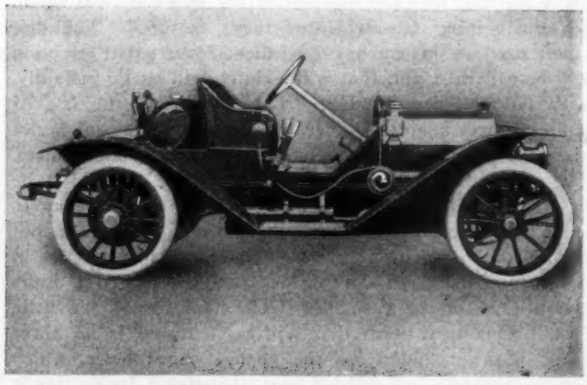
at, and the wheelbase of 114 inches enables the designer to arrange the body to afford plenty of room.

POPE-TOLEDO: Pope Motor Car Co., Hartford, Conn.—For 1909 the company offers Model XXII, which is a 50-horsepower touring car of no mean proportions, the price of which is $4,500, and in view of the manner in which the details were brought up to date it will not be too much to say that the interest the patrons pay the product will be extended throughout the year, much to the advantage of the company and the patrons as well. In the motor as used in this car the valves are in the head, and each set is controlled by one double-acting walking-beam. The crankshaft runs on ball bearings of a large size, and in this respect the Pope-Toledo is looked upon as distinctive, not only because of the use of ball bearings, but for the reason that the application is along lines indicating good sense and an assurance of the fact that a famine of oil will not result in a crop of melted-out bearings. This is no license to go without oil, but is a fact that oiling systems can go wrong, for a time at least. The double U chassis frame of chrome nickel steel is a feature of this car which is attracting a good deal of notice, and for rigidity it is looked upon as all to be desired. In divers ways the car is a fine representative of 1909 work in the automobile zone of activity, and reflects credit upon its producers.

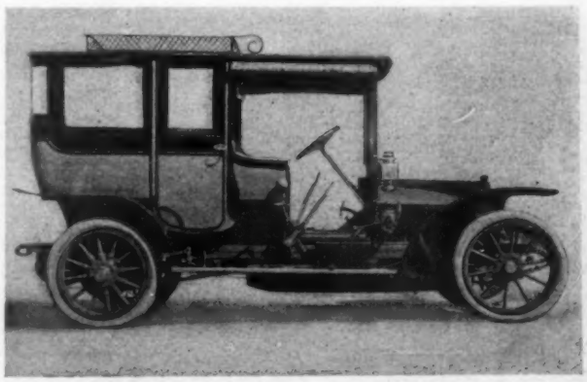
PALMER-SINGER: Palmer & Singer Mfg. Co., New York City.—The "6-60" of this line is one of the cars of the year, in relation to which there is quite some room for discussion involving late advances. On the other hand, the "4-40," known as the "Skimabout," is in brisk demand, and the spectators at the show are certain to regard it as a good sight. This car is fitted with a four-speed selective transmission and a multiple disc clutch. A "hill-pawl" is fitted to the driving shaft, and in divers ways the car is a most up-to-date proposition. In this car it will be remembered that the power plant is upon a subframe, and the accessories to the same are in positions to be reached at will without any trouble at all. The chassis frame is trussed through the waist; strength is thus added to an enormous degree, to the side members.

SIMPLEX: Simplex Automobile Co., New York City.—Rated at 53-horsepower, the Simplex four-cylinder model as it is shown at the Garden is a continuation of the last year's proposition, with such additions and improvements as the year's experience has influenced. Simplex cars were brought out originally to compete with the better grade of foreign automobiles, and imported materials abound in them. The wheelbase of the car is 129 inches, and the body work is always on a high plane. The details that were refined in the more recent of the models, which details are represented in the 1909 cars, include the elevation of the magneto, thus rendering it a little more easy to get at. Bosch high-tension jump spark magneto service is available in conjunction with a coil, thus affording the reliability to be expected in a car at a cost of $5,750.

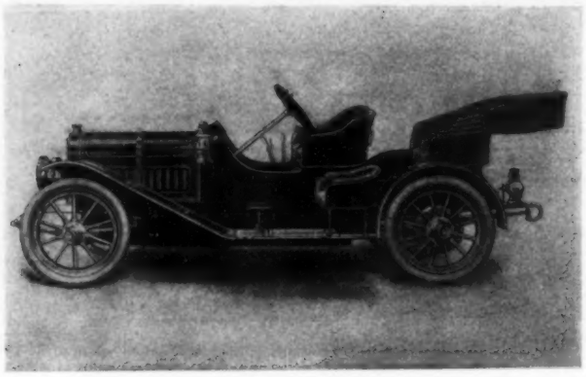
SELDEN: Selden Motor Vehicle Co., Rochester, N. Y.—One of the first of the full-fledged automobiles to come out with a low-price tag, and now in its second year, with a fine record of noiseless performance, the Selden "29," is to be at the show, there to add to its host of staunch friends. The Selden is a four-cylinder touring car along lines consistent with absolutely standard practice, with no sign of untried innovations of any kind. The motor is conservatively rated, with the accessories in a convenient place, and among other things of more than the usual note is the I-section front axle of one piece in a drop forging. As a matter of fact, every



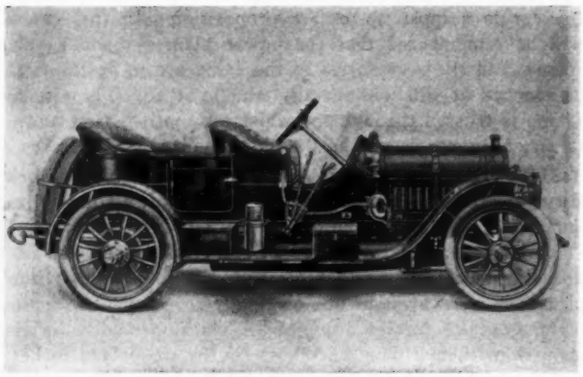
Palmer-Singer Skimabout, 28-Horsepower.



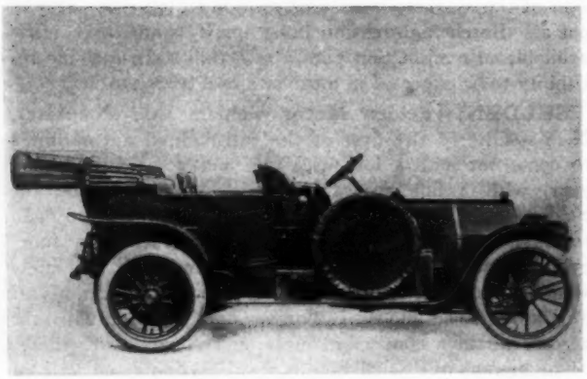
Palmer-Singer Limousine, 40-Horsepower.



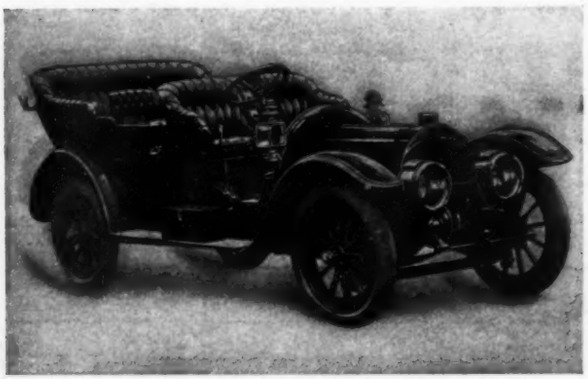
Pope-Hartford Roadster, 30-Horsepower.



Pope-Hartford With Small Tonneau.



Pope-Toledo Model XXII, 50-Horsepower.



Royal Tourist Model X, 42-Horsepower.

part in the car that can be a die forging is so made, so that weight is low for the power, and the speed or hill-climbing ability is there. The touring body is of the straight-line effect, and at the option of the purchaser a roadster body will be furnished. Magneto ignition is an extra, but all provision is made, so that the cost of the addition is moderate, and the time required to fit the magneto is but short; it can be added at any time.

ROYAL TOURIST: Royal Motor Car Co., Cleveland, O.—A four-cylinder car, in which a 48-horsepower motor has demonstrated its ability to cope with the situation in a manner as befits the occasion is the car known as Model M, and it sells for $4,500. The motor has cylinders, with a bore of 5 1-2 inches, thus showing that the motor is well up to its rating. The water-cooling system is of the usual Royal design, and the car is provided with a four-speed selective change speed gear that goes for good performance. In other respects the Royal is on a good basis, as, for illustration, the wheelbase is lengthened, the brakes are in good presence, and a self-starting device will be furnished as an extra. In addition to this car, the Royal offers the usual number of models, and much interest is certain to be taken in what is an assured good display.

STUDEBAKER: Studebaker Automobile Co., South Bend, Ind.—On the Studebaker for 1909 the ignition will be featured. This consists of the make-and-break system, which has been used for four years with a low-tension magneto as a source of current, but with the new Bosch magneto plug. This simplifies the wiring to such an extent that there is but one wire from the magneto to the bus-bar and four short wires with vulcanite grips which are pressed on the stems of the igniters. Model D, a four-cylinder 40-horsepower touring car, listing at $4,000, will be the principal car shown, this being fitted with all of the various bodies now extant and some original creations by this company. This car has a four-speed change-gear mechanism, with direct drive on the third speed. The case is a three-part one, bolted to a sub-frame, the countershaft being above the mainshaft. Ball bearings are used freely throughout the car, with the exception of the crankshaft bearings, which are plain, of Parsons white bronze. The workmanship on these cars is of a superior grade as befits a superior machine. In the line of materials, too, a very high grade of materials is used, although the company says nothing about this, believing that these are more in the nature of a necessity on a superfine car than of a luxury. The specifications show that all up-to-date refinements in design and construction have been incorporated in these cars.

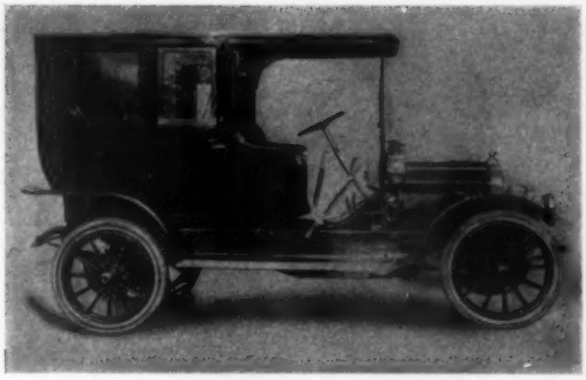
STEVENS-DURYEA: Stevens-Duryea Co., Chicopee Falls, Mass.—These very prominent advocates of the three-point suspension, coupled with the unit power plant and the forward location of the flywheel, will retain for the coming season all of these features. The disc clutch used on this car has one salient feature that attention will be called to, and that is the clutch will let go instantly, with no tendency to stick. This is due to the use of polished steel against leather on adjacent faces and is not always true of either cone clutches or metal to metal discs. The new Model X 24-horsepower car will be shown for the first time. This represents the desire of the company to cater to that class of ardent admirers who wish a car, but cannot afford a "six." It presents all the latest practice in design and materials, and, aside from the use of a four-cylinder motor, is a smaller-sized duplicate of the little "six." One new point that will be featured is an automatic position finder for the change speed lever, which insures accurate and instant gear changing. Using this it is unnecessary to look down or feel the way, for the gear

lever will stop automatically. By the use of the flywheel in front the clearance is so influenced as to depend only upon the rear axle casing, the height of this above the ground on Model X being 10 inches. This means that the flywheel cannot be injured on high crossings and similar spots in the road.

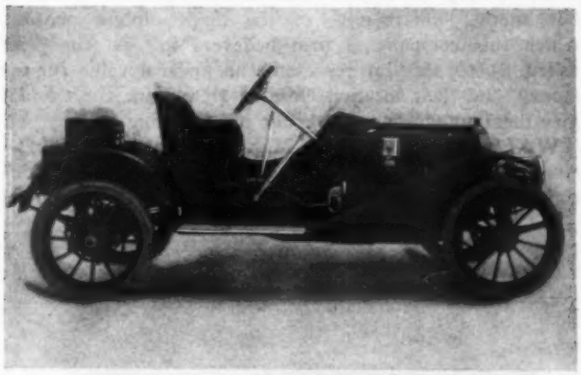
STEARNS: F. B. Stearns Company, Cleveland, O.—Characterized by the "white line around the radiator" feature of the older models, the baby Stearns makes its initial appearance at the Garden show. This is of 15-30 horsepower, with cylinders *en bloc*, following the latest small car practice, all other features following along the lines of the larger models previously built. These lines as relating to materials and workmanship are drawn very closely so as to include nothing but the best. The larger model is of 30-60 horsepower, the hyphenated rating in both cases being due to the use of a double-nozzle carbureter, an exclusive Stearns feature. The little car, it must be said, is of the more general shaft-drive type, while in higher powers the double side chains are retained, the sprockets and chains being of a special design which reduces the noise to a minimum. The crankshaft on all models is provided with annular type ball bearings. An innovation for this firm is seen in the incorporation of the transmission with the rear axle and differential housing. This is made of aluminum, which is not trusted to stand the severe road strains, however, a machined loop of forged steel which surrounds it forming the weight-carrying member of the rear axle.

THOMAS: E. R. Thomas Motor Co., Buffalo, N. Y.—The builders of the New York-Paris race winner have dropped for the coming year the old idea of being manufacturers of big cars only, and while the large models will be continued, their leader for the coming year will be a moderate-powered medium-priced car rated at 40 horsepower. This will be augmented by the continuation of the town car with a variety of bodies, this being rated at 16 horsepower. The medium-priced car, for $3,000 is a medium price for a good car, has a six-cylinder motor, with the cylinders cast *en bloc*—that is, in blocks of three, two of these being used. The crankcase, following a well-defined modern tendency, is cast in one piece, the shaft being inserted from the ends. This is of alloy steel, carried on three annular ball bearings, the use of these being a continuation of the practice inaugurated with the "16" town car, which has an exceedingly short stiff shaft or two ball bearings. The "4-60" at $4,500 is a continuation of the model which was so successful in the race around the world, the principal changes from last year, aside from the boring out of the cylinders to 5 3-4 inches, being but minor details making for refinement. The big "six," rated at 70 horsepower and capable of doing much better, is essentially a large car for heavy loads over all sorts of hard touring conditions. This car lists at $6,000 in a multiplicity of bodies, including all the standard types.

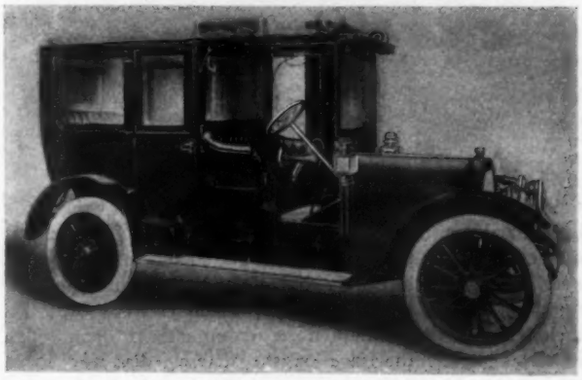
WALTER: Walter Motor Car Co., Trenton, N. J.—This is essentially an exclusive car for exclusive people, the factory output being a small, "personally conducted" one. Yet the price of the product is not exclusive, but is set at a very reasonable figure, considering the exceeding painstaking attention to details and the excellent grade of material used. The motor, a four-cylinder 48-horsepower unit, is hung in the frame at three points, this being one of the 1909 improvements—viz., the three-point suspension. Others are an increase in the diameter of the steering wheel by two inches, the substitution of platform springs at the rear in place of the semi-elliptics previously used, and the attachment of a ratchet stop to prevent the car



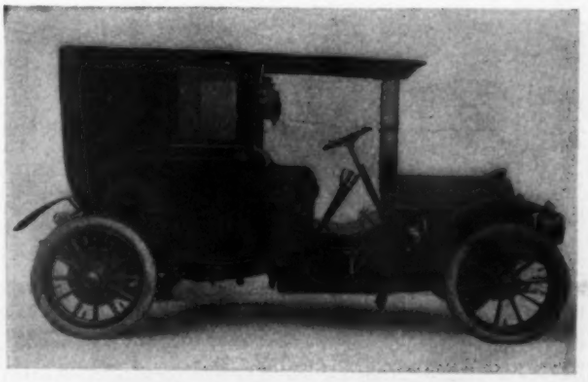
Selden Limousine, 29-Horsepower.



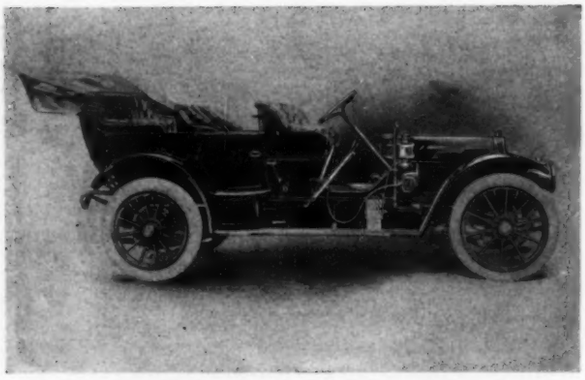
Selden Roadster, 29-Horsepower.



Simplex Limousine, 53-Horsepower.



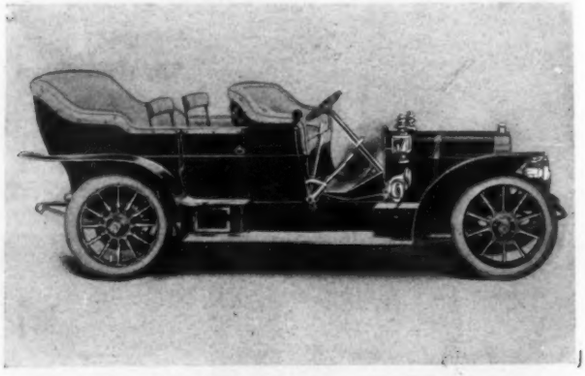
Palmer-Singer Town Car, 28-Horsepower.



Stearns 30-60-Horsepower Touring Car.

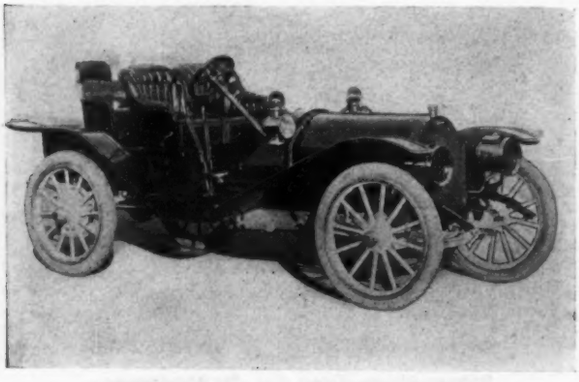
from backing down hill. The use of platform springs is but another outcropping of the three-point suspension, which this company is firm believers in. At the price asked, $5,000, this car represents an unusual value for the money, and their location close to New York City should give them an excellent outlet for the superfine product.

WALTHAM: Waltham Mfg. Co., Waltham, Mass.— Among the lifelong advocates of the air-cooled motor this company stands out clearly and distinctly. Featured among

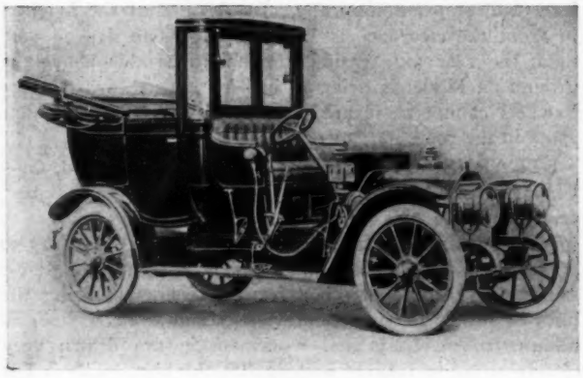


Thomas Flyer 4-60-Horsepower Touring Car.

the larger and more commodious cars will be the little buckboard, with single-cylinder motor, 3 1-4 inches in diameter by 4 1-4 inches stroke, air cooled, and mounted over the rear axle. This drives the car through the medium of a friction transmission, which consists of a 15-inch friction wheel mounted on a countershaft, upon which it slides across the face of the driving disc for speed variations. From the countershaft to the wheels the drive is by double nickel steel chains. These cars are equipped with a variety of different carrying spaces, which suit well



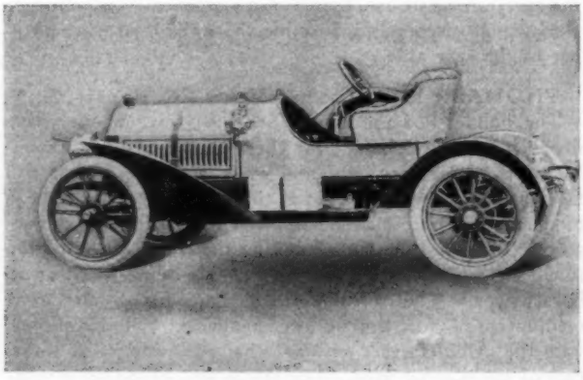
Stevens-Duryea Model XXX Runabout.



Stearns Landaulet, 32-Horsepower.

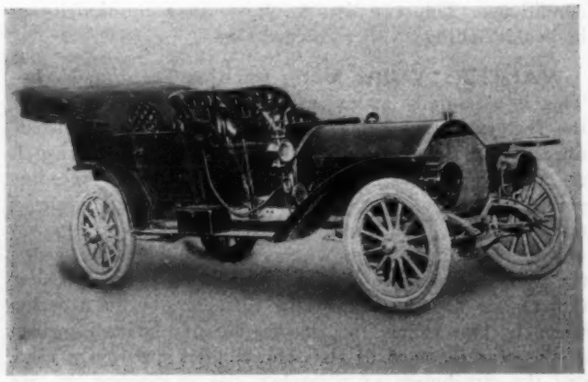
a multitude of light delivery systems. Coupled with the very low price of $350, this should have a very wide sale in the particular field to which it is adapted.

WHITE: The White Company, Cleveland, O.— Passing through the Garden it will take little time to ferret out the "steamer" of the show; there is but one. The one steam car will be found to make up in quality and the wide range of the uses to which it is put for lack of numbers, and the patrons of the industry evidently regard

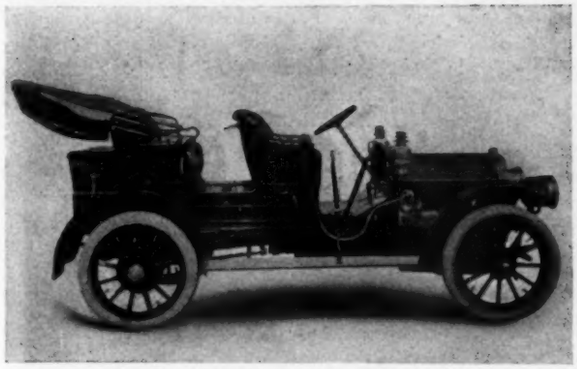


Thomas Six-Cylinder 40-Horsepower Runabout.

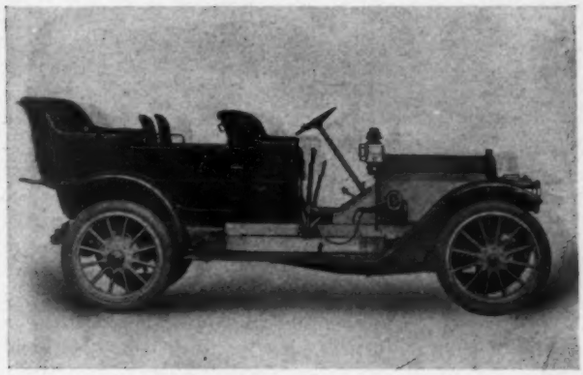
it as the *ulta mathule* of steam engineering, coupled with a display of automobile fineness that is not exceeded. Any description of steam cars, then, will reduce to a concrete statement of fact matching up perfectly with the "White Steamer." For the year the company will be content to supply two cars, the larger of which is known as Model M, and the other is known as Model O. The illustrations of the White car will clearly depict the character of the body work. The White engine as it is used in the 1909 cars is far and away superior in point of merit from anything



Stevens-Duryea Large Six 54-Horsepower.

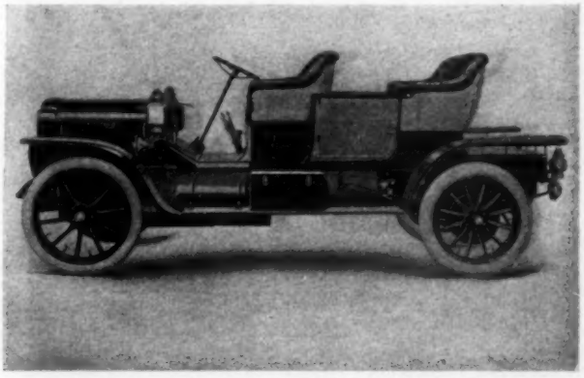


Studebaker Suburban, 30-Horsepower.



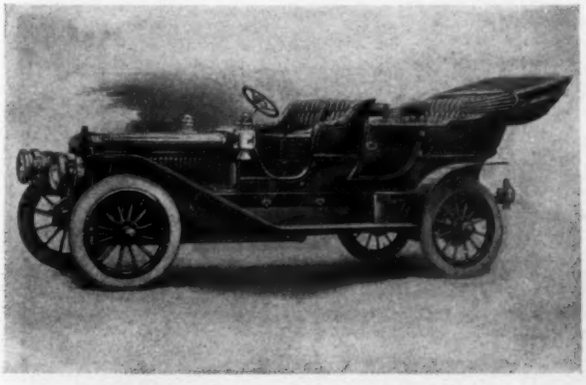
Studebaker Model D, 40-Horsepower.

previously turned out for the purpose. In the earlier products, using the Stephenson valve motion, which was actuated by eccentrics on the crankshaft, there was recognized chances for improvement, for reasons that were as common knowledge for years before the advent of the automobile. In the new White cars the "joy" valve motion is used, and the results are so far ahead of the Stephenson performance, and in so many directions, as to leave no ground for comparison. The joy valve motion is



White Steamer Runabout, 40-Horsepower, Model M.

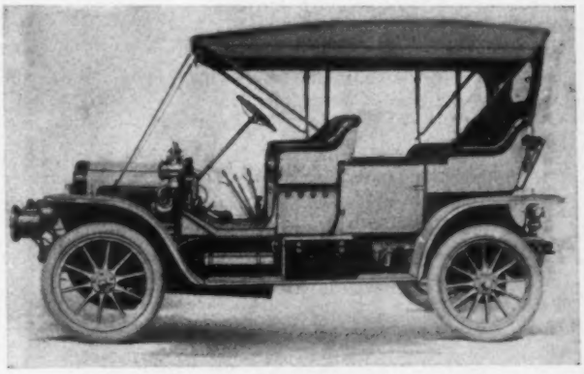
more compact, which would be as a small detail were it not for the gains by way of flexibility, and in the steam consumption per horsepower hour. The joy valve motion is actuated directly from the connecting rod, and, aside from the good that comes from the same, there is also the fact that the crankshaft is simplified, of tool steel, and ball bearings are used, of the annular type, using the crankshaft itself as the inner raceway; for which purpose the crankshaft is suitably fashioned, the materials being of the right grade for the purpose. In a hundred ways the cars



Winton Six Touring Car, 60-Horsepower.

is advanced along lines consistent with the highest possible development of the automobile and the steam power plan as used in the White.

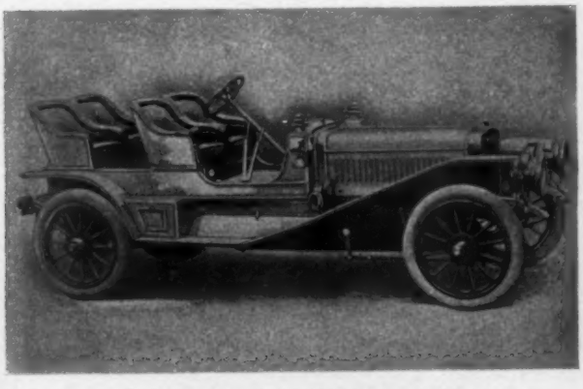
Take, for illustration, the water in the generator; it is not allowed to merely segregate at its own sweet will, depending merely upon a difference in weight as between hot and cold water. As the diagram of the generator will adequately show, the water (or the resultant steam), in order to pass from one coil to the next below, must



White Steamer Model O, 20-Horsepower.

traverse upwards to a level above the topmost coil, thence to the new level. It will be proper to say that the two models are alike in all particulars, as respects the power plant, excepting that one is of greater power than the other. In body work there are several options, as the custom in general.

WINTON: Winton Motor Carriage Co., Cleveland.—This is the low upkeep six-cylinder car. The makers say that the former is an inherent attribute of the latter, and as a consequence they will produce nothing but



Winton Six Runabout, 48-Horsepower.

six-cylinder cars the coming year. This policy as pursued the past year must have been a successful one, else it would not be continued. Two "sixes" will be produced, each with a host of different bodies to choose from, the principal differences; in fact, the only differences being in the matter of sizes. The smaller, with a six-cylinder 4 1-2 by 5 motor, is rated at 48 horsepower, while the 5 by 5 is called a "Sixty." Both of these will be equipped with the self-starter, which has been so successful in the season just closed. This, as is well known, is an air-pressure device, the air under pressure being compressed mixture taken off from cylinders one and six. This is stored in a pressure tank and is supplied to the motor by means of a special starting cock, which when opened allows the fluid under pressure to pass through a distributer to the proper cylinder. The carbureter will be continued from last year. This is of the two-nozzle type, with a throttle for each nozzle, these operating progressively. The multiple disc-clutch is also retained. This consists of 67 very small diameter discs, the size being kept down to reduce the inertia effect, while the loss in surface is compensated for by using a larger number of discs.

WHAT PATRONS FIRST SEE IN THE CARS.

In view of the fact that it is not so easy to "spin" a motor, it is a moral certainty that the average purchaser will think of the means by which motors may be started with ease. If a car is large, and if the motor is also of much power, then it is a good thing to think about, and purchasers will find that makers, too, have thoughts along the same lines, some of which thoughts are expressed in a most substantial manner.

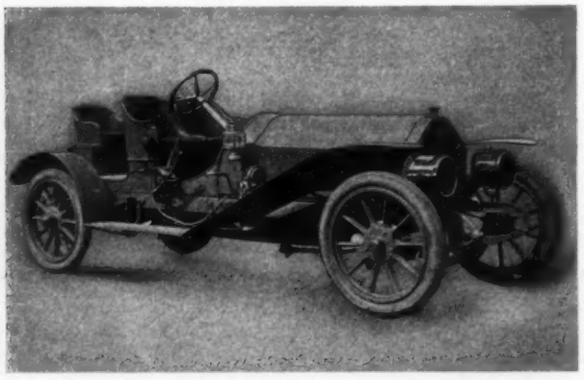
As a second consideration, purchasers are prone to think of the lubrication, since it is true that much trouble can be the result of inferior methods of landing the requisite amount of oil on the right spot at the propitious instant. The several available ideas are intended to do the work, each in its own way, all so effectively as to leave no question, and it is in such matters that the purchasers have the pleasure of picking the method that pleases them.

Ignition in a motor is about as essential as the motor, and in this respect the cars at the show allow of the widest latitude, since the purchasers will find all the good methods on the various cars, and they can take their choice. Magnetos are regarded as the most likely; transformers are used; they are of the "step-up" kind, and the Atwater-Kent idea is there. Then there is the magnetic plug, as put on the Studebaker cars, in which the Bosch magneto plug takes the place of other methods. Coils are used in all the different designs, among which the "master vibrator" makes for simplicity of the brand autoists will appreciate. Batteries are "storage" in many cases, if the magneto is not used as the main means; dry cells take the place of storage batteries if the battery is as an auxiliary. It is also a fact that in the Atwater-Kent plan the dry cells will do, since the system indicates economy in the use of current.

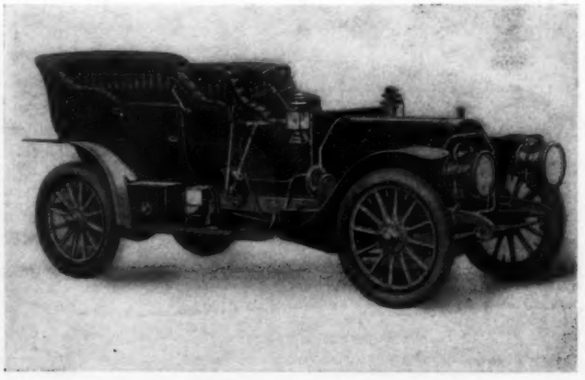
Lamps, lighting and the means embrace a subject which the average autoist allows to roam through his mind as a vagrant thought, sometimes until he has purchased a car. The plan is not one to be recommended as a rule, although it is a fact that the cars at the Garden are well fitted out with good lamps, with but few exceptions. This year there is a "black nickel finish" which should appeal to the average autoist. This finish is not so likely to tarnish, and it should be very permanent. It is a true nickel finish, and for that matter it is more permanent than bright nickel. Generators are in a fine state of development, most of them so nicely designed as not to "clog." They are of good capacity, do not use "carbide" on an extravagant basis, and the "flame" is steady, bright and in ample presence. Those who do not like generators can choose gas tanks; they are in the several desirable sizes, and they do the work in a manner to leave nothing to be desired. Of the piping there is little to be said unless it is to point out that it is up to a fair standard as a rule, and some of the companies take great pains to have the piping on a very certain basis.

Tops, windshields and fittings are for comfort. As a rule these items are as extras, and autoists will be at liberty to settle the questions for themselves in conjunction with the cars they may select. Tops are in far more substantial presence than formerly and windshields are of the kind which serve the purpose in a manner quite in keeping with the needs. The designs are of the "adjustable" genera, while the location and the slant are such as to keep the glass clear. This is a very important detail and the windshields at the show are in full accord with the latest ideas along these lines.

In equipment by way of extra tires the spare-wheel idea is uppermost, and the manner in which it is carried out by the various companies is in keeping with the rest of the automobile. There is one point, however, which does not seem to take root with that vividness which characterizes the situation in general. It is an assured fact that tires if they are kept free from wounds will last far longer than is the case under ordinary conditions. It would seem, then, as if autoists would take to the idea of vulcanizers and regard them as a regular part of the car equipment. There is no denying the fact that this and other details should reduce the cost of upkeep of cars to a marvelous extent, and it is believed that it is right to consider the several phases of the question.



Palmer-Singer Six-Cylinder Runabout.



Stearns 30-60 Standard Touring Car.

GROWING POPULARITY OF ELECTRIC VEHICLES

ACTIVITY seems to center around the battery to a considerable extent, although it is true as well that the uses to which the electrics are put is gradually extending. In the first place it will be understood that there never was any question of the splendid value of electric methods of goods transportation involving "short hauls." The long haul, on the other hand, is a matter depending upon the competence of the battery, as respects the radius of action, on a single charge. Even this is a matter that daily is becoming of diminished importance because it is a fact that the number of "charging stations" is multiplying, and as charging becomes more easy to manage the radius of travel on a single charge becomes a matter of less importance.

Town cars, taxicabs, runabouts and surrey types are increasing rapidly, and there are many indications of advances in other directions.

The question of tires was ever a matter of the greatest importance in connection with electric vehicles, owing to the weight, which on account of the battery makes for more than is customary in conjunction with gasoline cars. Knowledge of the true capabilities of tires has enabled the makers to meet the situation, until now the tire situation is much improved, as would be the natural expectation. All along the line it is to be noted that the wide use of electrics for many purposes is extending beyond the limits once predicted by the most optimistic.

Having thus generalized in relation to electric vehicles, it will still be possible to detail out important features and after a fashion show something of the progress made.

In the early days motors were wont to give more or less trouble, for the reason that, if they were not enclosed, they would be damaged by dampness, dirt, and mechanically. On the other hand, to enclose them was to have them burn out, since it was not then known how to afford the means for the escape of the heat, which is ever present and which must be tapped away. In the motors as they are to be found at the show this phase of the question will be found in shape, indicating that the designers of the motors had at hand all the latest information of an authentic nature bearing upon the subject, and they used it—at whatever cost.

The "drum" controller is used to the exclusion of the other forms in about every case, just as in railway work, in which this type of controller has well served the exacting purpose for a number of years. There are deviations in point of detail, to be sure, and of them knowledge will best emanate through the good office of the literature to be had from the respective companies.

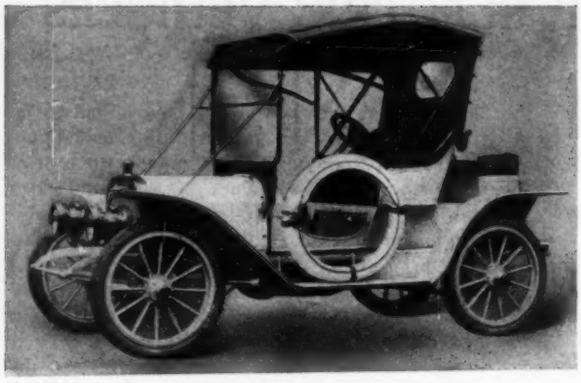
Few indeed are the autoists having had to do with the "electric" who will not fully understand the importance of wiring in a manner to protect the wiring from the fumes of the acid which rise like a "fog" from the battery during the charging process, or if the battery is in a condition of "mud," even during a heavy discharge. They will be glad to know that the question has been adequately cared for in a manner to leave no doubt of the result. Then the losses in the wiring have been reduced in that the sizes of the wire used are of greater section, and the joints have either been eliminated, or they come in places of the least damage; moreover, they are soldered.

There are divers ways of effecting speed changes in electrics. In some cases the motors and the battery, the latter in sections, are worked in series parallel, and all changes are made without inserting resistance. In other cases the battery is in series, and the motors work in parallel or in series. Then, there are the cases in which a resistance is inserted under certain conditions. As a rule, it is not desirable to employ a resistance in the circuit, since it is not economical in the main. On the other hand, there are conditions which warrant the use of the resistance, and in such cases it will be found.

The question of the number of battery cells to use is one depending upon the type of car, the mechanical efficiency of the same, and the size of the motor, which in turn takes into account the speed of the vehicle as well as the roads. For the little runabout types of cars it is customary to use as few cells as possible, and ofttimes as few as 11 cells are used. But if the cars are larger it is then customary to use 22 cells instead of 11, but in the standard examples of vehicles 44 cells of battery are used. As to the number of plates per cell, this is a question which takes into account the load on the batteries, the radius of travel and such matters. The present practice is to employ an adequate battery, and to select the types of battery best suited to the work. In special cases it is the custom to select "thin plate" batteries, in which the ampere rate is high, and in which weight efficiency is of greater importance than long life. Makers of cars do not recommend short life batteries, excepting under certain conditions, and as a rule the heavier (low rate) batteries are used for the purpose. Of course, if a vehicle must make long distances on a single charge, it at once becomes necessary to use the light plate with the high rate and the shorter life. On the whole, it is up to users to be sensible about this matter and select the best all-around battery for the purpose. They are all to be had in the electric vehicles at the Garden.

ANDERSON: Anderson Carriage Co., Detroit, Mich.—Of the products of the Anderson plant special mention will be made of the runabout type of electric, which is a car of high development, and time has been spent to bring it up to a fitting standard. There is a wide range of uses for the moderate weight electrics that will not lay down, even if the distance traveled on a single charge of the battery be very great. With a well-designed chassis and bearings of the anti-friction type in every place in which much power could be wasted, it is then but a question of battery and a motor equipment of the class which will show a high efficiency, both in point of weight and for power. The Anderson electrics are designed with an eye to the main chance.

BABCOCK: Babcock Electric Carriage Co., Buffalo, N. Y.—"If you are going to imitate the gasoline car, why not go the whole thing and make a complete job of it." So says the Babcock Company, and in the 1909 Babcock electrics the company has made good. The new Babcock electric town car, also used as a taxicab, is in line with the idea as above expressed, and it is generally conceded that the car is of the greatest utility and "dressy." Then, there is the "gentleman's roadster" of the Babcock series. In this car will be found

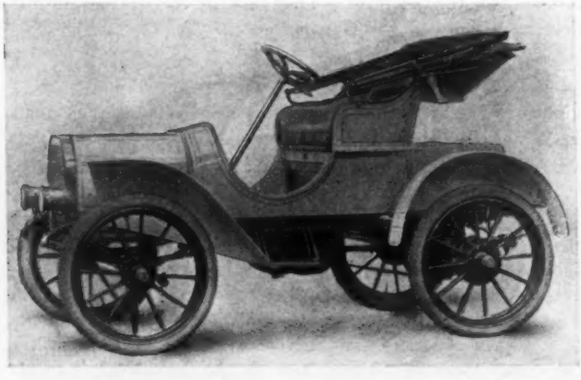


Babcock Resembling Typical Runabout.

all the requisites for an enjoyable "spin" on the boulevard, with never a fear of extending the trip beyond the safe radius of travel of the battery. The car looks fine, the road performance is notable, and the cost of maintenance is very low indeed. In this connection it may not be out of place to point out that the Babcock is so simple as not to be a problem to a boy, let alone a man. The control is worked out in a manner to assure the best results, and any semblance of complication is lacking in presence.

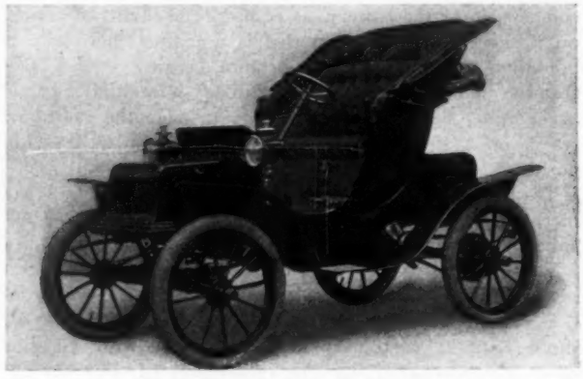
BAILEY: S. R. Bailey Co., Amesbury, Mass.—This company will be found at the exhibition in the Garden with its usual fine display of electric vehicles, and it is assured that the cars will create the widest interest. The line turned out by Bailey includes everything of value along lines consistent with the best practices of the day in the light of the most advanced advices from authoritative sources.

BAKER: Baker Motor Vehicle Co., Cleveland, O.—When the Baker electric was first presented to the market it was regarded in the light of a new departure, for the reason that instead of using 40 to 44 cells of battery but 11 cells were used, and the result was most gratifying. To digress a pace, it may be well to say that the Baker "Torpedo" raced on Staten Island in the early part of 1903, making the enormous speed of 80 miles per hour, although the misfortune of the occasion was by way of the car leaving the road. From that day to this there have been Baker "stunts," and the growth of the company has been rapid until to-day the Baker is a great industry. The Baker plant at Cleveland, in the vicinity of Edgewater Park, is a model to go by, both in point of hygienic arrangements and in the accuracy of the work turned out. Baker electrics show the result of an up-to-date plant in which the artisans are afforded adequate light, good ventilation and an even temperature. The Baker electrics at the show will be a feature well worth viewing, and it will compensate visitors interested in this class of vehicles if they pause a moment. The little "piano box" Baker is one of the sights of New York City on any fine day, driven as it is more often than not by ladies.



One of Baker Family of Runabouts.

COLUMBIA: Electric Vehicle Co., Hartford, Conn.—One of the oldest builders of electrics, and with a wide range of sizes and types of electric vehicles, this company always creates much interest on show occasions. The yellow surrey of the Columbia series is probably one of



Fine Lines Evident in Babcock Brougham.

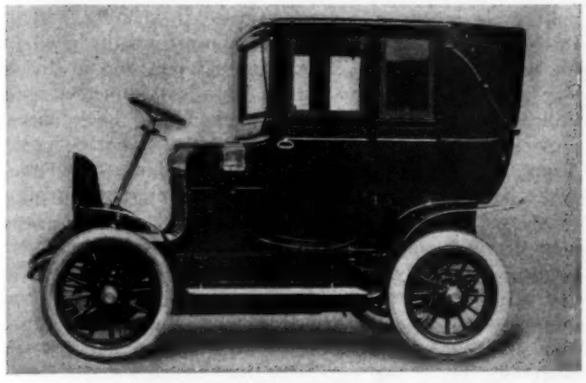
the cars of the genus which has gained more by way of popularity for electric vehicles than any other one car out of the well-equipped plant of the Columbia company. Many of the surrey type are to be seen in the congested centers, in mixed service, and the electric equipment is so very reliable as to be especially commendable. A descrip-

Lightweight Enclosed Baker.

tion of all the types of Columbia would fill a book, but to dismiss the subject without mentioning the town car would be to fail to take note of luxury on wheels, the scope of which has never been exceeded.

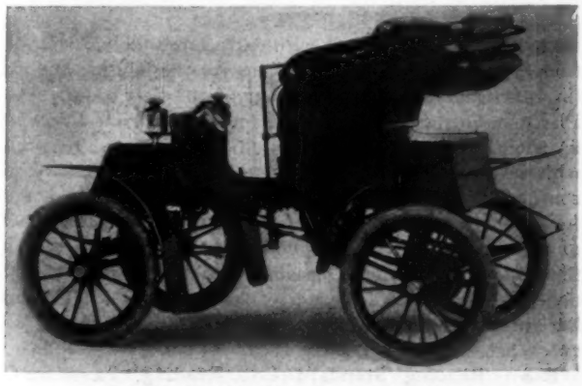
RAUCH & LANG: Rauch & Lang Carriage Co., Cleveland, O.—Along standard lines this company turns out a line of electrics which for style and finish are most appropriate. The coupé is a car of interest for many purposes, and is much in demand for doctors as well as for the family. Then there is the runabout and the Stanhope types to look at, as well as the special body work for any fitting purpose. The electric work on the cars of this line is of such a high character as to command the attention of the trade, while the harmony of the battery as it relates to the work is such as to assure a wide radius of travel on a single charge.

STUDEBAKER: Studebaker Automobile Co., South Bend, Ind.—The Model 13-A of the Studebaker is of the Stanhope type, and a car to be examined because of its lines and the general good that will be found in it. The speed of the Stanhope is better than 18 miles per hour, and the radius of travel is exceeding. The car weighs some 2,300 pounds, the tires are 30 x 4-inch (pneumatic) front and rear. The wheelbase is 73 inches. The coupé of the Studebaker line is another car that should be as popular as would seem to be the case. In this car the speed is 13 miles per hour, which is right for town



Columbia Will Continue Mark LXVIII.

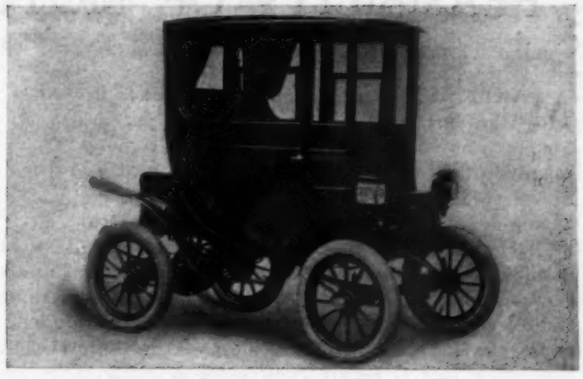
service, and the range of travel is that due to the use of 24 cells of 11 plate battery. The wheelbase of the car is 67 inches, and 30 x 3-inch (pneumatic) tires are used in front, while the rear tire equipment is 30 x 3 1-2 inches. There is one other point in relation to the coupé that is worthy of notice; the top is removable and a regular



Studebaker-Stanhope Has Lever Steer.

victoria or a gypsy quarter top can be substituted. The workmanship is up to the usual Studebaker standard.

WAVERLEY ELECTRIC: The Waverley Company, Indianapolis, Ind.—Among the interesting features of the display of electrics that by the Waverley Company will deserve something more than the passing attention of visitors. Four types of carriages are to be shown, two of the models that have not been seen before in any automobile exhibition. The distinguishing mark of the new Waverley is the patented drop sill, a feature which, by lowering the seat and floor of the car, adds greatly to its convenience in use and accounts for the peculiar compactness of build and trimness of design that mark the Waverley. The use of removable coupé tops, permitting an all-the-year-round service with a single car, is another point on which the Waverley people wax eloquent.



First Product of New Waverley Company.

A unique feature of the exhibit will be the special display of the new rear system of noiseless double reduction driving mechanism which distinguishes the latest type of Waverleys. This mechanism is attached to the body and its weight is therefore cushioned by the springs instead of falling directly upon the pneumatic tires. So effective is this cushioning of the principal weights that solid tires may be used with comfort. One of the latest models, No. 74, will be shown equipped in this way. A further advantage claimed for the driving gear is its noiselessness. This is due to a new system of lubrication that keeps the principal bearings in a constant oil bath and to the use of the herringbone type of gear already well known to Waverley users. Another mechanical feature about which the Indianapolis people are quite enthusiastic is the new controller that goes with this year's models. "The position of the reverse lever in the seat immediately back of the speed lever is a special convnience; the automatic locking device prevents accident, and the controller is practically trouble-proof if not fool-proof," said one Waverley enthusiast—but we will not spoil the story for our readers. They should get it from original sources at the show.

WOODS: Woods Motor Vehicle Co., Chicago.—A wide range of electric vehicles and one of the pioneers in this phase of the industry. It was in a Woods that some of the members of the Society of Automobile Engineers, while at the Summer meeting, held at Detroit last year, trailed along after a long string of gasolines, mile after mile, all day, and made every engagement on time. The coupé of the Woods line is a very desirable doctor's rig, protecting the occupant from the weather, and the control is all inside, including well-devised "magnetic" brakes as well as the usual set. For radius of action and low cost of upkeep the Woods vehicles have a very consistent record.

Woods Line Includes Popular Coupé.

FEASIBILITY OF MOTORCYCLE DEMONSTRATED

MAKERS are preparing for a brisk trade in this line, and as a prominent one put it: "There is no doubt that the motorcycle is coming rapidly to the fore." Indications are that the days of the cheap imitation of the motorcycle are inclining to oblivion; due in no small measure to the fact that the patrons of the motorcycle trade are wont to eliminate the troubles that such machines are naturally heir to. To again quote the same maker: "The only thing to be feared is the flooding of the trade with cheap motorcycles, the quality of which is cheaper than the price. A motorcycle that is poorly constructed is really more expensive than the average mind conceives." While it is true that such methods are much to be feared, the fact remains that the "cyclists" are not now likely to support such a venture to any great extent. At all events, it would seem from the motorcycles on exhibition this year that the old line of strictures are "stale." The motorcycles to be seen certainly do look to be in full accord with the spirit of the age, a spirit which indicates a desire to pay the price but to insist upon the fullest measure of quality. How any adventurer can swim against the strong tide set up in this direction is a question which will have to be answered in the light of further experience.

This is the year of the greatest advances, and while it it not new to see motorcycles with four cylinders, it is a fact that there were none "on show" formerly as they will be at the Garden. Then there is the question of the shaft drive; cyclists are now in a position to look them over (with the shaft drive) and judge for themselves the extent to which they will care to indulge. The motors with two and single-cylinder power plants are in the greatest profusion, and chain and belt drives look more practical than ever before. The frames are of the "diamond" and "loop" designs so well distributed as to render any attempt at fixing upon the trend quite out of the question. As respects the materials, it is to note the profuse use of alloy steel tubing, and an increase in the use of the large sizes of the same. There is evidence of the effect of the automobile in the motorcycle, in that there is a type of motorcycle in which a crank is used in starting, and in this case no pedals are used. Magnetos are included in the finest examples in the ignition systems, and in divers ways the accessories are on a basis no less permeated with utility than is the case in the automobile. The difficult problems were solved in a manner which indicates a fine display of ingenuity on the part of the designers of motorcycles, and the price is as low as can be expected, quality considered.

In the past some of the failures, of which there have been a surprisingly small number, were directly due to the desire of the users to improve upon the machines. The desire seems to be an American habit, and it is admitted that Americans have succeeded in improving upon about everything under the sun. The fact remains that it is at the expense of the machine, in any given case, that tinkering is done. When a motorcycle is finished it pays to let it alone, and when the desire comes on, then it is good time to tinker with something that is not in a state of completion. This year the incentive for changes will be at a low ebb, and this may be the solution of the problem. In other words, the motorcycles of the year are in a state of very satisfactory completeness.

NEW ERA: New Era Gas Engine Co., Dayton, O.—Of the motorcycles that will be seen at the Garden the New Era will attract a full share of attention. The product of this make shows the earmarks of that quality which comes from careful work in a shop noted for the quality of its work, and among the new features to be found on the New Era will be mentioned the absence of vibration, due to the 60-inch wheelbase and the right disposition of the weight, as well as the fact that the kinetic balance of the reciprocating parts is what is termed a satisfied couple. In the New Era there are no pedals, and a footboard is placed instead. Then the motor is started by a crank. The motor is "free" and two speeds are provided.

N. S. U.: N. S. U. Motorcycle Co., New York City.—The model De Luxe of the N. S. U. is rated at 6 horsepower, and is in every way a motorcycle to suit the buyer of more than the usual acumen. The details of design are modern and numerous of the features are novel. This type of the N. S. U. will attract the notice of cyclists at the show, and while the company has a wide range to select from, the fact remains that the De Luxe has the snap and the go so much to be desired. The company says, "N. S. U. means quality." The product seems to back up the statement.

PIERCE: The Pierce Cycle Co., Buffalo, N. Y.—That the motorcycle industry is limited in any way is far from a fact, as will be adequately illustrated by visiting the Pierce exhibit at the Garden. The Pierce four-cylinder model is something to look at; it is a shaft drive. The frame is with extra large tubing, and the four-cylinder motor has a magneto for the ignition and all the contrivances of a power plant of the first order. The Pierce is intended to be a permanent motorcycle to stand up against all possible road conditions and to be repaired with ease when after long service it becomes necessary to consider the matter of repairs. The appearance of the four-cylinder Pierce is graceful, and the obvious strength of the frame is in keeping with the undoubted power of the motor. Then, it is pleasing to note the shaft drive, under the circumstances, and to observe that all along the line the Pierce is quite up to the most fitting standard of excellence.

R-S: Reading Standard Co., Reading, Pa.—"Built and tested in the mountains." It is thus that the maker infers that his type of motorcycles can be taken seriously. That it is so taken is rendered apparent if only one will look about and note the many users who swear by the machines they use. For 1909 the company is showing models as follows, (a) loop frame; (b) diamond frame: (c) delivery van; (e) tandem, tricycle and chair models. The motors used in the R-S machines range from 3 to 7 1-2 horsepower, with single and twin cylinders, depending upon the power. The drive is with belt or chain, depending upon the demands of the patrons, and the ignition is with battery or magneto, as may be selected, the price changing accordingly. All loop frame models are fitted with 26 x 2 1-2-inch tires; all diamond frame models have 28-inch tires. In every case the accessories are most complete, and of a grade to leave nothing to be desired. The tire pump is large, and of good advantage.

THE PROGRESS OF THE COMMERCIAL VEHICLE

By MORRIS A. HALL.

AN industry that has progressed by leaps and bounds, with the prospect of future "leaps and bounds," is that of the power wagon. This has been held back, perhaps, by ignorance on the part of the employer of the time economy, which has been truly said to be money and which took the form of passive or stolid indifference. On the other hand, this same ignorance, present in the employee, took the form of opposition, strong and virile.

It is a fact that the latter are becoming more versed in the intricacies of the work vehicle as a result of the involuntary missionary work carried on by the pleasure car, which is working out in the form of a lessened opposition to the commercial end. This is manifested best by such little items as the readiness with which the cab drivers are taking up taxicabs. Similarly the farmers have gradually reversed their position, and many are to-day to be numbered among the advocates of commercial cars.

The employer, on the contrary, and with superior intelligence, has shown also superior stubbornness. A fact which has contributed somewhat to this is that the average, or, better, the great majority, of users of horses for trucking purposes do not keep any separate record of their trucking costs, so that they have absolutely no idea of the expense per ton per mile of moving their freight. Consequently, figures mean nothing to them, and it is impossible to show a direct money saving by the self-propelled vehicles.

This same lack of a record of horse performance also carries into the item of time. By this is meant that as no accurate record is kept of the time necessary to make a certain run with horses, it is not possible to make an intelligent comparison which would show the vast saving of time due to motor service.

Opposition Overcome as Supply Is Provided.

This is, however, being overcome in about the inverse speed of the industry to care for additional expansion, or, stated otherwise, the opposition is being overcome as fast as the commercial car manufacturers get into a position to turn out more cars and thus care for additional users. At present the production is small, but is growing each year. About every other week an addition to some vehicle plant is reported, and no less than once a month the announcement of some additional pleasure car manufacturer falling into line is made, the past month of December having produced two.

It is well known that the truck bearing any similarity whatever to the pleasure car, that is, in running gear (four wheels, the two fronts steering) and in power equipment, reaches its limit at about five tons. For loads above this, the power requirements are abnormal, the load and the power together require a different distribution, the limit for rubber tires is reached calling for something very different, etc.

Points Towards the Tractor.

All this points toward the tractor with a trailer or road train. In this much interest has been shown, and, although by far the greater portion of the work done along these lines has been done abroad, it will interest visitors to the Garden show to see one American example of a road train. This has a total capacity of 15 tons of live load, weighs about 12 tons, and is capable of a speed of six miles per hour. The vehicles are all of the six wheel type, the body being suspended upon four inverted leaf springs. The center wheels are the drivers, while the front and rear pairs steer. This multiple steering arrangement allows of the three vehicles, whose aggregate length is no less than 60 feet, turning in a 40-foot circle.

While the applications of vehicles of this capacity are necessarily limited, there is no doubt of the fact that in their own particular field they represent a vast advance over the previous arrangement which called for three or four trucks with as many drivers. In cases like mines segregated in a small place some distance from the railroad, a very promising field is opened up, but it is doubtful if they will find many opportunities in urban or suburban traffic.

Other independent commercial car problems include the six-wheeled truck, the lightweight low-priced delivery wagon, and the now omnipresent taxicab or town car. The first named has made little progress in the past year; in fact, it never has made any appreciable progress in this country. The delivery wagon, on the other hand, might be fairly taken as representative of the whole industry, such has been its progress. From the first delivery wagons, which were merely pleasure cars with a box or other commercial body, to the present form of car built expressly for and devoted entirely to the delivery service, has been a big step and one not unattended by danger to those who attempted to press the former type upon an unwilling public.

Delivery Wagons at Reasonable Prices.

To-day, however, we have upon the market at reasonable prices any number of delivery wagons, any one of which used with intelligence will give good results, so good, in fact, as to bring the vehicle into the "good investment" class.

The last named class is probably the largest, both in number of producers and numbers of cars produced. The peculiar nature of the vehicle, coming midway between the pleasure car and the work vehicle, perhaps accounts for this. In turn, this also accounts for the number of pleasure car builders, who have entered the commercial field with a car of this type. This was not a sharp breakaway from pleasure chassis practice, as a heavy truck would be, but was rather an easy forward step from a large to a small car with a dainty little enclosed body.

A noticeable tendency in the heavy truck class has been the loss of advocates for the five-ton truck in favor of the three-ton and lighter machine. Although gradual in its growth from inception up to date, this idea has, however, gained so much ground that no less than two of our principal builders devoting their attention exclusively to commercial cars have, to all intents and purposes, abandoned this size. The argument from the manufacturers' side is a matter of sales. He says, for every possible prospective purchaser of a five-ton machine, there are not less than half a dozen firms who can and will use one of three-ton capacity. The same line of argument may in turn be applied to the

three and two-ton machines respectively, by saying that for every buyer of the former there will be a dozen for the latter.

On the other hand, another of our commercial builders has recently brought forth a new five-ton machine. This maker, it might be added, does not list or build a three-ton chassis, so that it may readily be seen that he pins his faith to the reverse of the above proposition, or, put into other words, that there are more five-ton buyers than three.

Proportion of Motive Power to Load.

Coming down to the details, more attention is being paid to the proportion of the motive power to the load. The first machines showed a shameful lack of this, for they were mainly under or overpowered, the former being characteristic of the delivery wagons and lighter trucks, while the latter fault was found more often in the heavier machines. To-day this matter is more equally arranged, and the three or two-ton machines with 50 or 60-horsepower motors are few and far between.

So, too, in the matter of springing. The idea that the only necessity in truck springs was enough (and often too many) leaves to carry the load is fast passing, and many of the best trucks have springs of alloy steel correctly proportioned. This is a matter of dollars in the pocket of the owner of a truck, as the high grade steels of perhaps double price will last four or five times as long as the cheaper material with a multitude of leaves, meaning excess and useless weight.

Substantial Progress in Tires.

In the matter of tires, always a bugaboo to car owners, commercial or otherwise, substantial progress has been made due to the awakening of the rubber people to the fact that the service was radically different from that of touring cars and demanded different treatment. Aside from the improvements in existing types, many new types were brought out and many more are in prospect, to judge by the large number of patents granted in this line. Wood and sectional rubber have made gains that are noteworthy, while many anti-skidding devices have been brought out and tested, among which might be mentioned the Hartridge sectional tire, an English product.

For motor 'bus use the combination or gasoline-electric type of drive has gained many adherents, although for pleasure use the reverse statement would be more true.

Coming to the electric, this is found to have been more closely confined to its class, viz., the short haul proposition, although many new users in this field do not so classify. Upon inspection the latter will be found grouped in a class of their own, having adopted this power because of the fact that they were engaged in electrical work or otherwise has electric power of "juice" in their plant in excess quantities, so that the item of charging the batteries assumed less importance.

Steam has in the past year won many friends in the commercial industry, although in fairness it must be said that these have been confined mostly to fire, police, hospital and similar service, where the standard chassis could be used with a special body.

Range of Use Extending.

The wide range of users has now become wider than ever before, as was natural with a natural and healthy growth, but the greatest spread has been in or rather for fire service. This branch in which the self-propelled car advantage of speed is most advantageous has made the greatest strides forward, many of our cities after extended tests having discarded horses entirely. This has been due mostly to inherent superior ability on the part of the self-propelled apparatus, but also in part to the growing scarcity and consequent high prices of suitable horses. A single instance of this may be mentioned. A Southwestern city in need of heavy fire horses could not buy them because the appropriation allowed only $350 per horse, whereas the prices for suitable horses ranged from $400 apiece upwards.

The outlook for the coming year in the commercial vehicle line is more than bright; it promses to be a record year. With the economies attendant upon the recent hard times, the attention of many business houses was called to the excessive cost and growing inefficiency of horse traffic. This has resulted in a thorough investigation of the power wagon and its merits, which will result in largely increased sales the coming Spring, or as soon as the horse equipment can profitably be disposed of. Many prospective buyers of trucks put it this way: We are going to change over to motor trucks, but must dispose of our horses and wagons first. This we will do in the Spring as soon as the market for horses and horse equipment improves, Winter being the poorest time to sell.

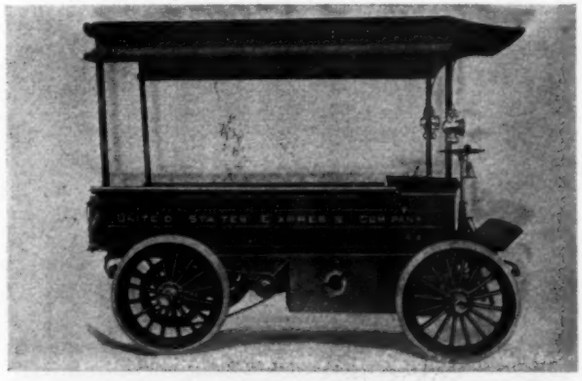
AUTOCAR, Autocar Co., Ardmore, Pa.—Autocar characteristics include several features of note, among which mention will be made of the fact that the chassis frame is of steel, in which hickory is accurately fitted to render the frame as a whole strong and to give a certain flexibility not to be realized in any other way. In the motors of the Autocar it is the custom to use two flywheels, and the crankcase design enables the operator to remove covers to get at the essentials, as the camshaft, crankshart, connecting rods, and for the purpose of making a general inspection. In the rear axle work is free from joints, and brazing is avoided. It is the idea of the Autocar designers to keep away from all the modes of procedure which, while they may work as a rule, do represent a percentage of failures on the count that workmen are not up to a high level of efficiency every day in the year, and to eliminate the chance of failure is to avoid the personal equation. As a strictly utility proposition, the Autocar should, and undoubtedly will, appeal to merchants and others with goods to transport.

CADILLAC LIGHT DELIVERY, Cadillac Motor Car Co., Detroit, Mich.—Like the product of other pleasure car manufacturers, this one-lunger does not differ in a marked degree from the single-cylinder touring car. The body, of course, must differ, and the driver's seat, too, but otherwise the differences are minor ones. This is not in itself a bad fault, for the success of these cars with drivers of mediocre ability in pleasure fields presupposes a duplication of this same success in the commercial work, where the driver is an unmechanical horse-driver. In the service of groceries, laundries, hatters, jewelers, shoe dealers, florists and similar business houses requiring a light weight but quick delivery, this car has been a big factor in the development of the industry. Its construction and method of operation, designed with a view to economical operation, has done much to favor its further use, an average of about $15 per month for all expenses, including fuel, by a Far Western company having about a dozen of these cars, showing what this sturdy little worker can do. As upkeep and fuel bills are those

watched with anticipated horror by the small fellow, who has just ventured to buy a delivery wagon, this little car has made good.

CHAMPION, Champion Wagon Co., Owego, N. Y.—The name of this line of electric trucks is indicative of their quality, Champion, the quality that makes champions, that is the keynote of the product. The full line consists of light trucks, delivery wagons and heavy trucks from 500 pounds capacity with a radius of 35 miles on one charge of 2,500 pounds with a 30-mile radius, and still larger, heavier cars with a smaller radius. All of the product has double motor direct drive equipment. Now that the economy of the electric vehicle has been demonstrated to the satisfaction of all who have investigated the subject intelligently, particularly for short hauls within the battery radius, it may be expected that a great number of these will be put on the market, being simpler to manufacture and build than a gasoline-driven car of equal carrying capacity. The electric may be relied upon to work in all kinds of weather, regardless of heat and cold, which cannot be said of the horse.

ELMORE, Elmore Mfg. Co., Clyde, O.—The popularity of the taxicab necessarily manned by horse-drivers has been partly due to efficient operation, which was only made possible by the inherent simplicity of the mechanism.



Champion Electric Express Truck.

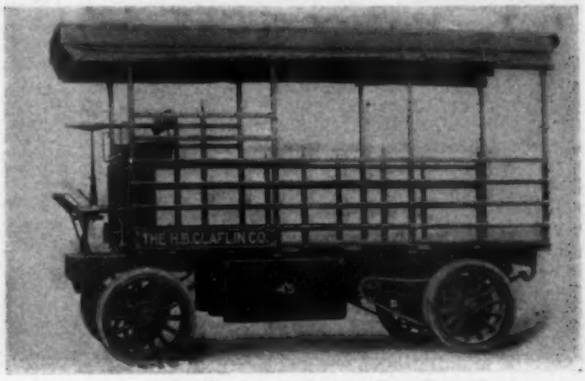
Among the few devices which have made this simplicity possible none rank higher than the two-cycle motor. Dispensing as it does with valves and all valve operating means, not only is the great number of parts materially reduced, thus reducing in the same proportion the spare parts which must be carried, but the sources of noise are reduced and the weight is reduced. More than all this, perhaps, is the feeling of security which the innate simplicity of this prime mover gives to the operator, with which comes also a sense of confidence, the whole resulting in superior operation. For these reasons this cab has made progress continuously from its inception to date, with the prospect of this continuing indefinitely in the future. No more promising field of development has been opened up in the history of the commercial car than that offered by cab construction. This company is to be congratulated upon an early and successful entry into this field.

FRANKLIN, H. H. Franklin Mfg. Co., Syracuse, N. Y.—The air-cooled feature of the motors on Franklin touring cars will be continued on their line of commercial cars also. These include L-1, a light delivery wagon of 1,000 pounds capacity; L-2, a heavy delivery or light truck capable of carrying 2,000 pounds, and J-3, a two-ton stake truck. Not only the engine, but the frame of wood, full-elliptic springs and other essential features will be retained. All of these vehicles have the engine beneath the floor boards and front seat, which materially

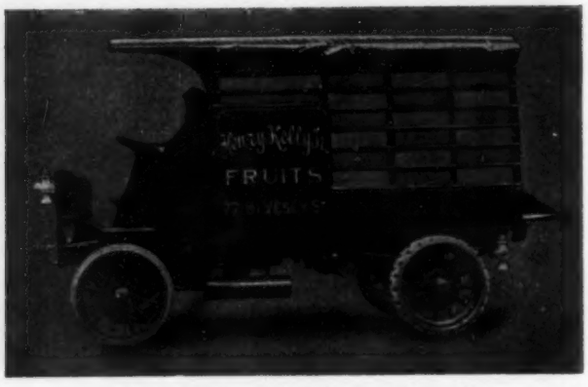
Police Patrol of the Franklin Company.

shortens the front end of the car and thereby decreases the wheelbase. The latter is a valuable feature on a commercial wagon, affording, as it does, facility in turning and manuvering in small spaces. Thirty-two-inch wheels are provided on all three types. The L-1 front wheels are 32 by 2 1-2 and the rear 32 by 3. The L-2 front wheels are 32 by 3 and the rear 32 by 3 1-2. The J-3 front wheels are 32 by 3 and at the rear 32 by 3, with twin tires. The J-3 has a stake platform with a carrying area of 62 1-2 square feet, the diameter being 5 by 10 1-2 feet. In these trucks a worm drive rear axle is used. The worm and the worm wheel are exceptionally large, and the tooth pressures are therefore at the minimum. The J-3 moves normally at the rate of about ten miles an hour and has carried a load of three tons up an 11 per cent. grade one-quarter of a mile in length and paved with brick. In all these commercial vehicles are used full elliptic springs in front and semi-elliptic and coil springs at the rear. This is productive of easy riding at the seat and increases the load capacity. The rear axle is in such position that it carries two-thirds of the weight. This also reduces the work of front springs.

GENERAL VEHICLE ELECTRIC TRUCKS, General Vehicle Co., New York City.—In the field of electric commercial vehicles there are few exhibitors; those who do show cars, however, will make up in quality for the lack of quantity. One of the most interesting sections will be that of the General Vehicle Company, of New York. This company is the successor to the Vehicle Equipment Company, the pioneer in the commercial automobile field and the builder of a large percentage of the electric power vehicles now in commercial service. Five of the seven sizes manufactured by this company will be shown, the smallest being a light electric delivery runabout with closed body, having a capacity of 350 pounds' load, a speed of 14 miles per hour, and a mileage of 50 miles'



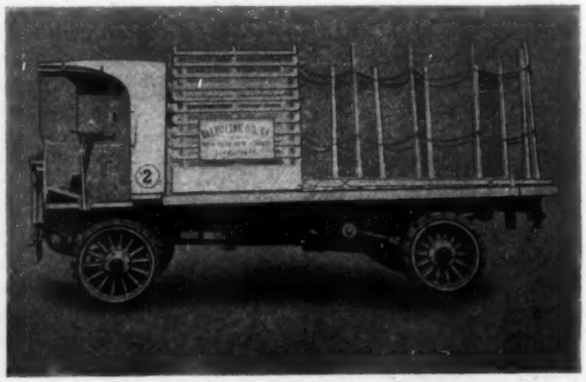
Heavy Truck of General Vehicle Company.



Two-Ton Truck of the Hewitt Company.

travel on one charge of the battery. Standard models of wagons having 1,000 pounds, 2,000 pounds, and 3 1-2 tons will be shown ready for work. These have a radius of action, respectively, of 40 miles, 40 miles, and 35 miles, while the speeds are 11, 10, and 7 miles per hour. A representative chassis of 2 tons' capacity also will be shown, illustrating the general design of all models of the power plant construction. The company has a modern factory in Long Island City, and is building many of the electric trucks and delivery wagons used in New York City. Its power vehicles are also in use in a majority of the large cities of the United States.

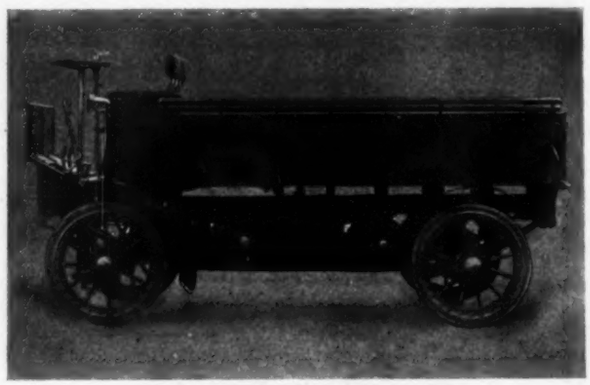
HEWITT TRUCKS, Hewitt Motor Co., New York City.—To give satisfaction a motor truck, or, in fact, any commercial car, must run continuously for a year or similar long time before overhauling. This necessitates the best of materials, workmanship and design. In the line of trucks produced by this firm the two former points have been sharply accented by the use of the best materials procurable in this country or abroad and the finest of workmanship both in the machining operations and in assembling. While in the latter, the matter of designs, opinions may differ, the fact remains that a very original and well-thought-out product has resulted. The left-hand control used by this company for several years past has now been copied by many other manufacturers, being the feature of the commercial exhibit at the recent show. In the matter of spring suspension for the radiator, planetary transmission, heavy long stroke, slow-speed engine and other advanced features, the industry has not yet copied these, good as they are, but this may be expected the coming season. The simplicity of the planetary transmission and its usefulness in the commercial vehicle industry for this reason have been appreciated and taken advantage of by several well-known makers. Hewitt has produced



Five-Ton Truck of the Hewitt Company.

an excellent example of this form of speed change device and operates the same with pedals, which are so interlocked that each one automatically throws the others out of engagement. This is an enclusive feature.

KNOX TRUCKS, Knox Automobile Co., Springfield, Mass.—These people were pioneers in the commercial field, and the lead which they then obtained has never been relinquished. At the present time they stand in a similar position with regard to motor-propelled fire-fighting apparatus. By this is included fire chiefs' cars, auxiliary squad cars, salvage and first-air wagons, chemicals and other strictly fire-department vehicles. That these wagons are economical and successful workers is shown best by the Springfield Fire Department's experience with their auxiliary squad automobile, which cost but $144.62 to run for a year, with $85.14 for repairs, as against $534 for horse service, repairs being equal. This formed a saving of $390 per year, which in a few years would pay for the car. Not only do this firm build fire wagons, but a line of excellent trucks as well, the latest of which to be announced is the five-ton truck. This big wagon has a 50-horsepower water-cooled motor with equal bore and stroke, 5 1-2 inches. The feature of this truck's cab and driver's seat, which is situated above the engine, is the large amount of space allowed to get at the motor. This



Light Truck of the Knox Company.

is also arranged so that the rear portion of it by loosening a few bolts may be turned over backwards out of the way. This feature is one that will be appreciated more by the truck driver than by the lay public, to whom it means nothing. To the former, on the other hand, this means a great deal in making repairs, as, for instance, in replacing a cylinder. When the cab is solid and low this is a bigger job than putting in a new engine transmission would be, but in this case it would be rendered comparatively simple.

PACKARD TRUCK, Packard Motor Car Co., Detroit.—Years of experience in the production of a superior touring car could not result otherwise than in the evolution of a superior truck once attention was turned to that field of endeavor. In the construction of the Packard truck the manufacturers turned to this problem the accumulated good experience of many years' producing in their three-ton power wagon, a prime mover of superior merit. It is not strange, in view of the foregoing statements, to find these trucks making good all over the country. A recent trip from Pittsburg to Wheeling, W. Va., demonstrated in a remarkable manner this fact. This distance of 67 miles, an unusually long trip for a truck of this high load capacity, was made in 6 hours 25 minutes actual running time, an average of about 10½ miles per hour. This was only meritorious when the hilly

mountainous character of the road is considered, viewed in which light it forms a remarkable performance. The figures for operation, including oil, gasoline and all supplies, are of equal interest, being but $2.09, which represents a cost per mile of $.0312. Now, with horses this would have been a two-day trip and two very big days at that, with a figure per mile of no less than eight or nine cents. So, without intending it as such, this long tour showed the marked superiority of the motor over the horse truck.

POPE-HARTFORD AMBULANCE AND PATROL, Pope Mfg. Co., Hartford, Conn.—In this newly opened field of hospital and police service the combined qualities of the speed and mobility of the pleasure car with the carrying capacity of the truck have served these vehicles as a starting point from which to make the greatest progress of any branch of the industry in the past year. The ambulance has an enclosed rear opening body provided with stretchers and low cots, as well as such modern equipment as an exhaustive study of ambulances and hospital appliances has enabled the manufacturers to say were necessary. The police patrol, while having an enclosed body also, has longitudinal permanent seats to accommodate ten or more policemen. The usefulness of this vehicle with its ability to take that many policemen anywhere in minimum time is self-evident. This may be had also, with the seats hinged to let down, giving room for a bed or cot and thus converting the wagon into an ambulance. By the use of this style of equipment the same car does double duty. Later construction, the details of which have not yet been given out, state that this same chassis may be fitted up for a chemical or a hose wagon.

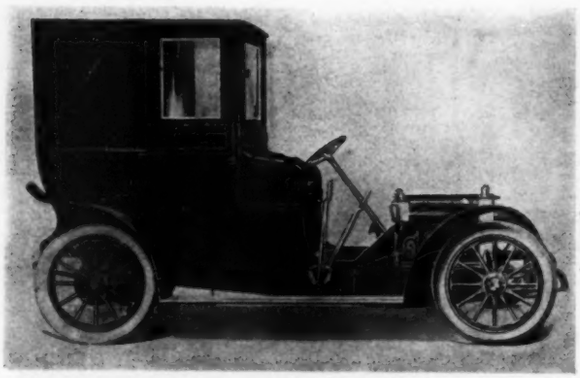
SAMPSON TRUCK AND ROAD TRAIN, Alden-Sampson Mfg. Co., Pittsfield, Mass.—Without a doubt the most interesting exhibit in the line of heavy commercial cars will be that of the Alden-Sampson Manufacturing Company, which will exhibit its road train, and for the first time a new four-ton truck. The latter will make its initial bow to the public at that time, but the former will be a repetition of the exhibit of last year. The latter will be awaited with interest by the trade at large, as the details of this machine, which have thus far found their way into print, have been few and far between. With a four-cylinder water-cooled vertical motor of 5-inch bore and equal stroke, rated at 40 horsepower, this truck is well equipped. In the change speed gear, with four forward speeds operating on the selective principle, a new idea in truck construction is advanced, this being the first truck to have a four-speed transmission.

Studebaker 1500 Pounds Delivery Wagon.

The road train is probably the largest motor carrying arrangement made in this country. The ordinary four-wheel truck reaches its maximum carrying capacity at about five tons, overloads of 50 per cent. bringing this up to 7 1-2 tons. In this road train, then, we have the next largest unit. It consists of a tractor furnishing the power and arranged to carry 3-4 tons load as well. The trailers drawn by this tractor, which have six steel-lined wheels similar to it, have a capacity of 6-8 tons each. This allows of 9-12 tons with one trailer and so on with more trailers up to three, which would give a carrying capacity of 21-28 tons.

STUDEBAKER ELECTRIC TRUCK, Studebaker Automobile Co., South Bend, Ind.—The electric truck or wagon was one of the first developments of the automobile movement, and the pioneers in this include the Studebaker line. These are complete, covering the whole demand in six standard sizes, with paying load capacities from 800 pounds by natural steps up to five tons. In any one of these any type of body may be had to meet the requirements of wagon and truck users. The electric truck for all ordinary service, not including long hauls, has been shown to have many advantages, chiefly on account of the freedom from frequent adjustments and the fact of electric motors having a revolving, not a reciprocating, motion. An additional point in their favor and one that is along lines which may be strictly up to date, is the fact that the ease and simplicity of operation of electric wagons is remarkable. The reputation of the parent Studebaker house is extended to cover the commercial vehicles, as well with the result that the motto of "the automobile with a reputation behind it" may be applied with equal force to the power wagons, considering the word automobile in its broader sense to include all of the former.

The Road Train of the Alden-Sampson Manufacturing Company.



Thomas Town Car, 18-Horsepower.

THOMAS TOWN CAR, E. R. Thomas Motor Co., Buffalo, N. Y.—The recently developed field of taxicabs and town cars is one that many pleasure manufacturers have ventured into. No list of these would be complete unless it included the firm which evolved the discussion-producer when they made public the details of their cab chassis, the Thomas town car. This was one of the first American cars with a block motor and probably the first with two bearing crankshaft, these bearings being of the radial ball type. This construction allowed of a remarkably short engine. This in turn favored a short wheelbase, which, taken in conjunction with the narrow tread allowed of the short radius of turning action so necessary on these public service cars. The instant successful use of these cars in all of the large cities, Boston, New York, Washington and others, placed this manufacturer at one bound in the rank of able small car builders, his previous position having been with the large car only. These cars are elegant in their appointments and their use is not restricted to the public service by any means. In fact, town cars have become very fashionable with exclusive people for shopping, theaters, calling and all fashionable functions, and in this field are gradually supplanting the horse broughams, coupés, victorias and station wagons so generally used. Being primarily designed for this work and constructed with that end in view, they do not qualify in any sense in the same category with the ordinary small touring car adapted to this service by the application of a closed body.

WALTHAM MERCHANDISE WAGONS, Waltham Mfg. Co., Waltham, Mass.—In commercial work by far the largest field exists for the smaller lower-priced cars, which, just because they are smaller and lower powered, are within the range of usefulness and purchasing ability of the masses, the butcher, the baker and candlestick maker, as it were. The Waltham Manufacturing Company has shown discretion in confining themselves to this field exclusively, with a chassis having horizontal opposed water-cooled motor, bevel friction transmission and double-chain drive. This chassis may have any body suitable for the work it is to do. The entire power plant, consisting of motor, radiator, cooling system, friction transmission and countershaft, are mounted on a pressed steel sub-frame, which can be quickly disconnected and dropped down upon a truck and removed for convenient repairing or the substitution of a reserve power plant, in this manner keeping the car or a number of cars constantly in commission. The exchange can be made in less than an hour. This is economical and convenient for the merchant using a number of cars, for an emergency car will not be necessary. This principle of grouping parts is carried throughout the entire construction, the power plant itself being subdivided into smaller groups of co-acting parts, interchangeable with similar groups kept in reserve for quick repairs.

WAVERLEY ELECTRIC TRUCKS, The Waverley Co., Indianapolis, Ind.—These new people, successors to the Pope Motor Car Company, will continue that firm's unexcelled line of electric commercial cars. These have a very wide range from eight-passenger or 1,200 pounds up to five tons, the latter size being a favorite among the brewers. In considering the question of power wagons, urban and interurban service must be separately considered, the data, considerations and principles controlling the service being quite different in the two cases. It is generally considered that the latter, the interurban, offers the greatest field for the gasoline car, the inherent limitation of the storage battery precluding the operation of electrics over distances close to or greater than the battery radius. The urban or city service, on the other hand, gives a field in which the electric may compete on nearly equal terms. It is in this field that the greatest competition does exist and in which the electrics more than hold their own. Any one familiar with the Adams Express service in Buffalo or Macy's department store delivery service in New York City and many others will see the truth of this statement at a glance.

ADVISABILITY OF PROPER SELECTION.

With a display of vehicles in the commercial section to fill every possible want, it remains for the users to look the situation over with a display of acumen and avoid the mistake of a half-hearted selection at the cost of ultimate failure. When horses are considered, the best is counted none too good. When it comes to power wagons, the same holds true, only to a more marked degree. An appropriate selection is one in which the vehicle is not only suited to the work to be done, but it remains for the purchaser to take into account the future. If the business is one which partakes of permanence it certainly will pay to put enough money into the vehicles to make sure that upkeep will be moderate.

Style is not so much a factor in commercial work, and it is fair to assume that repairs will be made year after year until the car is as the proverbial "jack-knife"—nothing but the handle left, etc. Upkeep is tolerable in a well-designed power wagon, just as it is in any well-designed machine for any purpose. But it must be well designed, and it must take into account the fact that it is intended for continuous service. If the bearings are of the kind which can be replaced, then it is plain that when they are too loose to take up or replace them will be the proper thing to do, and the cost of the replacement should be but slight. If, on the other hand, a car is of a half-baked design, it is possible to believe that the bearings cannot be replaced unless at a cost which will serve as a ban to the process.

If the power plant is one to stand the road inequalities and the high "torque" phenomenon, then it will be possible to take into account a continuity of the service over a term of years. But should the motor and the transmission be distorted by the high torque, then it is assured that the power plant will go beyond repair within a short while and a new power wagon will be the best solution of the problem. All these matters have to be considered, and it is worth while to consider the competence of the builders of the power wagons contemplated for use in a given service, and ascertain if the wagons are truly in accord with the requirements. The cars at the Garden are wisely selected to illustrate competence.

PROMISING VALUE OF THE A. L. A. M. LABORATORY

By THOS. J. FAY.

FORESIGHT eliminates gradient and serves as a lubricant for the ways leading in a beeline to the greatest possible satisfaction all around. The "Twentieth Century Limited" starts from the "laboratory." But the laboratory in itself is of almost no value at all. The information must be appreciated, and the dictum of the laboratory must be the rule and guide of the constructor. The mere knowing makes for nothing, unless it can be said that crime, if such there be, consists in knowingly doing wrong. At all events, it is not only desirable to have a laboratory, but it is important to conduct the process with the greatest possible care, and the knowledge allowed to emanate should be from what might be termed a "high source," of undoubted competence.

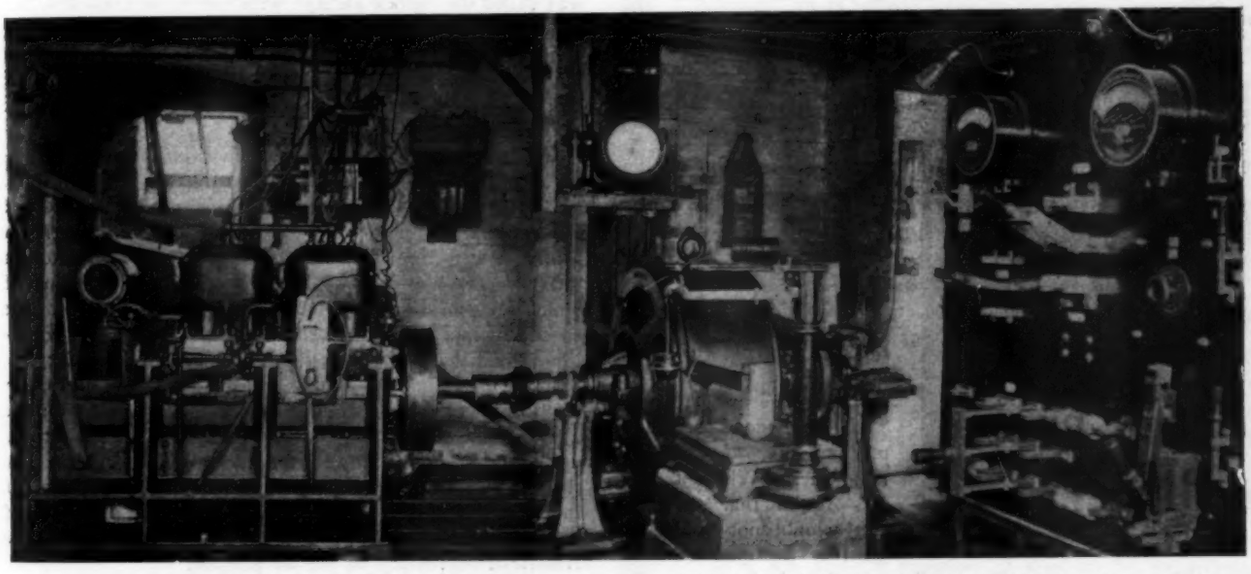
When the automobile reached a certain point in its development it was the consensus of opinion that something was lacking, and that something was prone to manifest itself as materials or the proper utilization of the materials available for the purpose. When the question was ripe for discussion, then it was that the A. L. A. M. took time by the forelock, and in establishing the "Mechanical Branch" refrained from tieing the hands of the directors of the same, while they, in turn, free to follow their own bent, made bold to pave the way to success by the road called knowledge, even at the expense of prolonged and painstaking investigation, at a cost, which, reckoned in the abstract, footed up to a pretty penny.

As a concrete proposition, the cost was a mere *brutum fulmen;* in other words, a harmless thunderbolt; harmless in the sense that the cost was slight on a pro rata basis, and a thunderbolt from the point of view of the surprises in store for the men who previously thought that the fabricators of steel had kindly imparted all of knowledge that was good to know.

It is claimed that in Russia the common people should not know too much. The users of steel were as the common people, and they were fed on a baby food that failed to impair the digestion of the feeders. On the other hand, it cannot be said that the eaters gained in weight, especially in the region of the pocketbook. The laboratory was the place in which the proportions of the food were ultimately fixed upon in accord with the dictates of what might be called a "balanced ration," which balance showed a lacking as the situation did obtain prior to the advent of the laboratory.

At first the several makers of automobiles looked askance at the doings of the "Mechanical Branch," primarily because the cost looked out of proportion to the results, and, again, in view of the propaganda of the venders of material, ever ready to promote a fallacy if the same would only serve as a trough or a chute, down whose slippery concave money would flow to keep the water from evaporating out of the stocks, which to the one who can read spells high price and low quality of the materials emanating from such sources.

On the other hand, automobiles were imported from abroad, the reputations of which were so good as to cause wonder in the light of facts under the nose of every American builder. Why the American cars would not stand the pace, was the question, and as one French designer put it: "Copy the car if you like; make everything in exact replica; it matters not, the car will not be the same." The question was, Why?



Electric Dynamometer for Use in Determining the Actual Horsepower of Automobile Motors.

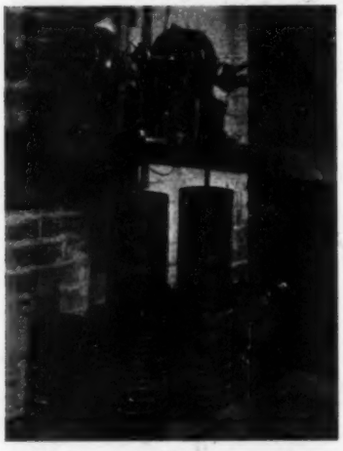
The learned gentleman from France was telling the truth, and he know that the "quantity makers" in America would defeat every attempt to interject quality if it was a question of the quality of the steel. Just so long as the makers of automobiles were content to depend upon the salesmen of the steel mills for the information they required, just so long was it possible for the steel makers to keep to the quality of the greatest dividends—for them, not the makers of cars. It was rather strange to see the makers of automobiles taking instructions from "salesmen" from the steel vendors, using the "Bessemer" they were so anxious to get rid of. The same makers of automobiles did not allow their own salesmen to dictate as to the designs in the engineering offices of the makers of automobiles.

The great importance of the laboratory was not, at first, quite so apparent as it is to-day; nor is it sure that every user of automobiles understands the situa-

tion with that vividness which impresses itself upon one, when he counts the money in his own "till," only to discover a material shortage. It may seem a little farfetched to thus prolong the discussion without elaborating upon the details of the laboratory itself, but it is desirable, as is adequately shown by simply relating the story of the hunter who, after a rabbit, uncovered coal, in the process of digging the rabbit out of his burrow, and so hot was he in his quest for game that the value of the coal was measured in curses because it was in the way.

It would be as a waste of time to talk about a few machines and measuring instruments, however precise they may be, without drawing a picture of sufficient clearness to establish the facts so that they will find lodgment in the "think-tank" of the reader. It is like "skimming" over a story.

In the laboratory it is the aim to get at the inner facts and to account for the successes and the failures in a way that leaves no room for doubt. A piece of steel is a very uninteresting bit of matter to the man who has no depth of knowledge; this same piece of steel is an adequate subject for the greatest mind during the interval from maturity to the grave. But if the steel is of interest, so are the wood and the oil, the gasoline and the varnish; all can take time, and in each will be found something that will persist in defeating success in the absence of knowledge of the proper means of thwarting the ills.

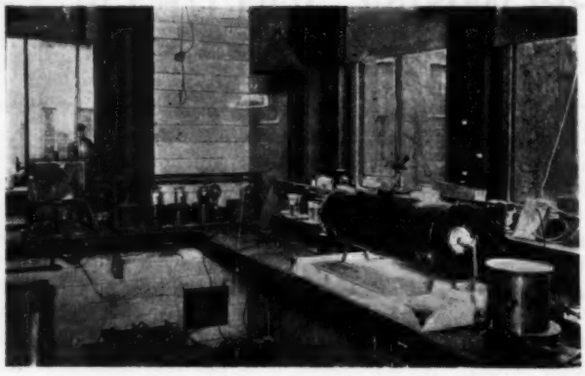


Souther Testing Machine.

The steel maker says: "You do not have to know what the composition is so long as the material will do the work." The same good samaritan says: "Leave it to me." When it was found that the steel would not hold together the question was, What is the composition of the material which proves to be of no fitting value? To know is to analyze, and a chemical research demands the equipment for the purpose. The conclusion was that a chemical division in the laboratory was as necessary as the roof over the building to conserve the heat in the Winter time.

Next, it was decided that the conventional physical properties of the materials would serve as a rough guide to the facts to be elucidated in the long run, by means of more exacting tests of the materials, the qualities of which indicated value to the extent to make further research worth while. The result was a testing machine had to be provided, one with the wide range to handle iron, with its low strength, on the one hand, and nature hard alloy steel on the other; as well as all the materials within the top and the low limits.

Then it was desirable to be able to note the texture of the materials, and to just look at them with the naked eye was not to be able to see the real situation. Mycroscopic work was regarded as of the greatest value, and "photomycrographs" would make the records permanent. This equipment is probably quite as important as any, since it has been fully established that steel resides in several conditions, depending upon the composition and the mode of fabrication, not to mention the fact that heat treatment does alter the texture of the steel for good or for ill.



Equipment for Heat Treating Steel.

In due course it was established that the "static" ability of steel had little to do with the facts, from the point of view of life of the same, under conditions involving "kinetic" work. The older methods of fixing upon what was called the "shock ability" were not to be regarded, but it was soon found that this shock ability was not to be considered as a fair measure of dynamic ability from every point of view. There was the question of the effect of vibrations, within, let it be said, well within, the elastic limit of the materials.

It was this latter question which proved to be of the greatest importance, and the "vibratory test," though long, and even costly, did in the end pronounce the quality of the material in terms which were not to be lightly thrust aside. When Henry Souther took hold of the matter, it did not take him long to devise a machine by means of which the vibrations could be artificially induced into test specimens, and the life of the materials under such conditions could then be measured with the greatest certainty.

In the meantime the shock tests of "Fremont" and other methods were taken advantage of, in order to accumulate all the knowledge possible in relation to the materials to be used in the automobiles of the Licensed Association. In these several ways, under the guidance of the committee of the Mechanical Branch, the questions were all thrashed out, and it was in thus going at the matter which led to the American supremacy of the automobile.

In the meantime it was necessary to be able to show that actual improvement could follow, else what would be the gain in thus maintaining a costly situation? To be able to fix upon the gain it was necessary to devise testing equipment such as would allow of the cars being tested, in order to show the power developed and the manner in which the same was actually utilized, taking into account the several losses. Thus was it necessary to go into the analysis of the performance of the cars, and by so doing determine

Chemical Equipment for Analyses.

the extent of the losses, and to the extent possible, eliminate the losses or reduce their magnitude.

All these questions were taken up, and by a systematic course of procedure the whole situation was reduced to A B C. True, it is the A B C of the technical man and the language are foreign to the average autoist, or to the inventor whose ability consists in evolving an abstract idea. On the other hand, the men of ability were there, and they devoted themselves to the task in a manner which is now proven by the quality of the automobiles (as a whole) to be seen at the Garden.

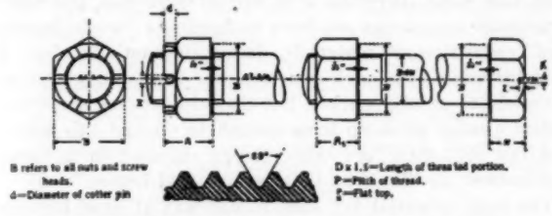
The illustrations of the equipment in the laboratory of the Mechanical Branch of the A. L. A. M. will give to the interested reader a fair idea of the scope of the work, and, in some measure, tell the reasons why the cars on exhibition are as good as they are said to be. This same laboratory is the great incentive, the excuse, in fact, that the steel makers use in their increased endeavor to deliver better

Association of Licensed Automobile Manufacturers.

STANDARD FOR

HEXAGON HEAD SCREWS, CASTLE AND PLAIN NUTS.

The following drawings and table (from Mechanical Branch Bulletin, No. 18) give in summarized form details as to the screws and nuts:


B refers to all nuts and screw heads.
d—Diameter of cotter pin
60°
D x 1.5—Length of threaded portion.
P—Pitch of thread.
⅛—Flat top.

D	¼	5/16	⅜	7/16	½	9/16	⅝	11/16	¾	⅞	1
P	28	24	24	20	20	18	18	16	16	14	14
A	7/32	17/64	17/64	21/64	7/32	25/64	25/64	29/64	29/64	33/64	1
A1	7/32	17/64	17/64	1	7/32	25/64	25/64	29/64	29/64	33/64	1
B	1	1	7/8	11/16	1	1	1 1/16	1	1 1/16	1 1/16	1 7/16
C	7/8	7/8	1	1	7/8	7/8	1	1	1	1	1
E	7/8	7/8	1	1	1	7/8	7/8	7/8	7/8	7/8	7/8
H	7/8	11/16	7/8	11/16	1	13/16	11/16	11/16	7/8	11/16	1
I	7/8	7/8	1	1	1	1	1	1	1	1	1
K	7/8	7/8	7/8	7/8	7/8	7/8	7/8	7/8	7/8	7/8	7/8
d	7/8	7/8	7/8	7/8	7/8	1	1	1	1	1	1

DIMENSIONS.

All dimensions in inches.

FINISH.

All heads and nuts to be semi-finish.

MATERIAL.

For all screws and nuts—steel,

Tensile strength, not less than 100,000 lb per square inch,

Elastic limit, not less than 60,000 lb. per square inch.

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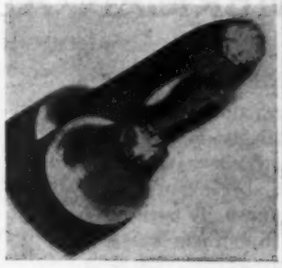
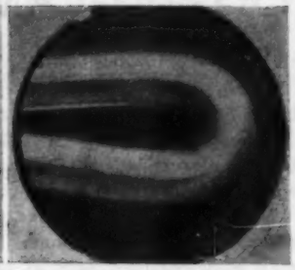
material, and the one remaining question is, Will they ultimately put the price down to the point such as will enable the users of automobiles to get what they are entitled to at a fair cost. True, the cars are reduced in price this year; equally true, the quality is on a high plane, yet even so, Carnegie is authority for the impression which in substance is to the effect that the public is being milked. In conclusion, it is easy enough to say that the laboratory of the Mechanical Branch has established the fact that the materials should be up to a certain fitting standard, and the makers of the cars were enabled to reduce the price of the cars by thus eliminating the failures in service; they cost money, since the defects have to be made good. It remains for the steel maker to reduce the cost of the material to a point indicating a fair return to them, when, lo! the buyers of automobiles will then be in a position to realize further the great advantages due to the up-to-date methods of the A. L. A. M.

Among the advantages of the laboratory will be mentioned by way of immediate results the improvements wrought in the several grades of steel used in the parts of the greatest responsibility. Prior to the establishment of the laboratory it was not uncommon to note spring



Pulled Test Specimen.



Cold Bending Test.

breakages on a scale which could not be tolerated, unless as a temporary condition pending the time when it would be feasible to introduce suitable grades of steel for the purpose. In the laboratory it was possible to examine the grades of steel which failed in service, and, knowing the characteristics of the same, decline to use more. Of the grades of steel in which the requisite qualities did seem to reside, it was possible to learn more and to improve the "formula" so as to lend haste to the process as well as the quality of the steel and bring the cost down.

Besides spring steel there were grades of alloy steel used for crankshafts and for gears. They had to be investigated, and in the due course of events the whole matter was sifted down, eliminating every stray suspicion of mystery and improving the steel for the respective purpose, besides reducing the price to a point within the striking distance of the buyers of automobiles. But the greatest advantage came by way of the investigation of the various means by which carbon steel could be improved and in the process imbued with kinetic properties.

In automobile work, unlike structures, it is of the greatest importance to give to the steel the ability to withstand shock and high-frequency vibrations. It is a fact that a piece of steel which might sustain for ages in a bridge would "fag" out in a few days in an automobile. Knowledge of the limitations and of the ability of the various grades of steel was gained in the laboratory, and a series of "treatments" enabled the A. L. A. M. to determine the improvements wrought by subjecting the steel to the several heat treatments for the purpose sought.

It is not alone a question of steel to be investigated. Take, for illustration, aluminum; it was quickly ascertained that if the walls are thin the materials are of greater strength than will be true with thick walls. On the other hand, it is assured that noise will follow if the walls are thin. Under the circumstances the designers were enabled to follow a course such as would afford the maximum strength consistent with noiseless performance. In the same way many questions were disposed of, and automobiles were brought to a high estate.

Photo Micrograph of Steel.

AMERICAN AUTOMOBILE STEEL

By HENRY SOUTHER, A. L. A. M.

EVERY known steel used for commercial purposes is just as available in the United States as anywhere else in the world.

Norway and Sweden have unusually pure ores, but the raw materials made from them are just as readily obtained here as elsewhere. There is no mystery about them; they are just pure and good. When our fine steel makers want good raw material they get it, whether it be from Sweden, Spain, Africa, Cuba or Lake Superior. Our steel makers are just as well trained as any and can make the best of steel.

They do not always make the highest grades of steel, because the demand does not always exist. Here, then, lies the real reason why early automobile product in the United States was not of high-grade material. It was not demanded. On the contrary, by some it was pooh-poohed; the advocate of fine steels was laughed at. "Why buy 15-cent steel when steel could be had for 2 cents?" "With our design any old steel will do," was sometimes heard. Our earliest makers (with exceptions, of course) did not have time to think about what kind of steel they might use. They were too busy making something that would go and keep on going.

Now all is different; the pendulum has swung the other way; some are buying 15-cent steel and putting it where it does no more good than 2-cent steel. Popular opinion demands it, and it is advertised. Many, however, have at all times kept pace with the art and began to use high-grade, high-priced steels, as far back as 1900, where such steels were called for.

Steels were tried and fully proven. Expert knowledge was used conservatively, and there was no violent swing of the pendulum from the worst to the finest, from one extreme to the other. No advertising was done. A trade secret could not have been guarded more closely. Good cars were built. The secret of the use of steel is to put the *right steel in the right place.*

The highest-priced imported steel suited for horseshoe nails would not do for an automobile spring as well as the lowest-priced, lowest-grade Bessemer steel made; or, for another extreme, the best chrome-tungsten tool-steel at 60 cents a pound would not make as good rivets as ordinary steel at 2 cents.

It is not always best to use the very best, the ideal steel, for a purpose. The very best is sometimes difficult to handle commercially. Better results may in some cases be obtained by using a slightly less ideally desirable steel. This brings up the importance of handling steel. Much skill has always been expended in handling tool steel; it has always been regarded as most important.

Not so with structural steel; and yet just as much is to be gained by handling it so as to produce a strong, tough material, capable of sustaining shock, vibration and the banging it gets, in an automobile.

The makers of guns, armor-plate, propeller-shafts for torpedo boats, have for many years practiced with much skill the suitable treatment of structural steel; but these people and their engineers did not, generally speaking, start the manufacture of automobiles; so this skill was not fully used by the automobile builder.

Some engineers went from the one industry to the other, carrying this valuable knowledge. These men helped to produce the high-grade cars made in this country, which have been every bit as good as any cars in the world, so far as materials and wear are concerned.

All steels were available; and in the United States the right steel was selected for a purpose. It was properly handled and treated from start to finish, the result being a perfectly balanced car, so far as wear was concerned. No more could have been done in Europe or elsewhere. Worse has been done in Europe, as shown by the way some imported cars have disintegrated after about two years' use.

In other words, the materials are available everywhere; the knowledge of how to use them is not. That is the difficulty. Breakages are due quite as often to bad design as bad material. The worst of it is that the bad designer may be found in combination with the bad chooser of materials. He "knows it all."

In this same direction it is unfortunate that too many automobile companies are born to develop a "world-beating idea" regardless of materials, design or anything else. It is unfortunate that such concerns live long enough to put automobiles on the market, but they do because some rich victim usually gives up long enough to do just this and to find out that there are other things required in an automobile than an idea even if it be a "world beater."

The right material for such to use was at hand but was not selected, and even the "idea" was ruined perhaps by not using the right material in the right place.

Some builders of fine machinery (at the head of their kind) have started cheerfully into automobile making, using the same materials and same designing methods modified to suit the new business, only to discover at great cost that the automobile is "different." They did not call in any help; why should they if at the head of their profession?

The knowledge and materials were available but were not selected, and yet some people blame such failures to the fact that the United States cannot make the fine steel found in Europe.

Unfortunately those who know the least about steel and its treatment are continually rushing into the public press and spreading a lot of rot about steel. Such stuff is read by many who ought to know better and is followed to their harm. The good steel is there just the same, awaiting intelligent selection; and good cars are made by those who select wisely. At the same time, it must not be forgotten that it is quite possible to make a sturdy and good car with no expensive steel in it.

The design must be right, however. The product will not be light. Until very recently no steel other than simple carbon steel ever entered into the construction of the best locomotives. They did not need to be light, and long experience had produced a suitable design. Several excellent automobiles built of relatively ordinary steel, but with design and material suited to each other, exist and have done splendid work.

All this goes to show that the materials are to be had for the asking at a price. The problem is to know what to ask for and how to get best value for money spent, all things considered; what is right for one job may be wrong for another, nor is it suggested that free advice be accepted from steel makers.

OUTLOOK IN THE AMERICAN AUTOMOBILE INDUSTRY

By E. P. CHALFANT, General Manager A. L. A. M.

IN many fields of engineering there has been a most interesting evolution by way of improvement in materials, design and methods through the reciprocal effort of the constructor and the metallurgist. In no case, probably, has that advance gone further in recent years than in the higher grades of machinery. The combustion motor, the motor car, and by no means least, the modern tool, have stimulated investigation and led to discovery of new and most useful alloys.

In solving the problems of the automobile builders, notably in getting the requisite combination of strength with limited space and weight, important developments have been accomplished which have a bearing on general machine construction. Inventive genius was forced to overcome difficulties which had never been encountered hitherto, except, possibly, in a limited way.

In this work the Association of Licensed Automobile Manufacturers has played a most conspicuous part. The membership of this Association is as follows:

Apperson Bros. Automobile Co.	Kokomo, Ind.
The Autocar Company	Ardmore, Pa.
Buick Motor Company	Flint, Mich.
Cadillac Motor Car Company	Detroit, Mich.
Chalmers-Detroit Motor Company	Detroit, Mich.
Corbin Motor Vehicle Company	New Britain, Conn.
Electric Vehicle Company	Hartford, Conn.
Elmore Manufacturing Company	Clyde, Ohio.
Everitt-Metzger-Flanders Co.	Detroit, Mich.
H. H. Franklin Mfg. Company	Syracuse, N. Y.
The Haynes Automobile Company	Kokomo, Ind.
Hewitt Motor Company	New York City.
Knox Automobile Company	Springfield, Mass.
The Locomobile Co. of America	Bridgeport, Conn.
Lozier Motor Co. of New York	New York City.
Matheson Motor Car Company	Wilkes-Barre, Pa.
Packard Motor Car Company	Detroit, Mich.
The Peerless Motor Car Company	Cleveland, Ohio.
The George N. Pierce Company	Buffalo, N. Y.
Pope Manufacturing Company	Hartford, Conn.
Pope Motor Car Company	Toledo, Ohio.
The Royal Motor Car Company	Cleveland, Ohio.
Alden Sampson, 2nd	Pittsfield, Mass.
Selden Motor Vehicle Company	Rochester, N. Y.
The F. B. Stearns Company	Cleveland, Ohio.
Stevens-Duryea Company	Chicopee Falls, Mass.
Studebaker Automobile Company	South Bend, Ind.
E. R. Thomas Motor Company	Buffalo, N. Y.
Walter Automobile Company	Trenton, N. J.
Waltham Manufacturing Company	Waltham, Mass.
Winton Motor Carriage Company	Cleveland, Ohio.

It may be said unreservedly that through the efforts of this Association, the standard of American automobile steels which in past years have been looked upon in a secondary light has been raised to a plane even higher than that of foreign manufacture.

Standardization is what many users have longed and hoped for. The A. L. A. M. has brought this about, notably in screw threads, rod and yoke ends, spark plug shells, motor power rating, etc. During the past four years new standards for the various metals used in automobile parts have been worked out and annually compiled, with notes and instructions on the proper handling of the same, for the A. L. A. M. members.

The great development of four or five years has been the refinement of construction, aiming at absolute reliability; and the proof of the success is seen in the 150,000 automobiles now continually running in the United States. Incidentally, it may be said truthfully that the American automobile is the machine par excellence of the world for interchangeability of parts. To-day also we find the American-made automobile, not alone the product of a few, but of at least thirty manufacturers, a match for the best foreign car in world-wide use, and for unusually severe road conditions, like those of our own country, where our machines were developed (not on the boulevards of Europe), superior in many ways.

This has been conclusively and forcefully demonstrated by the magnificent American cars and classes shown at recent exhibitions, more particularly at the stands of the members of the Association of Licensed Automobile Manufacturers, and by the eminently satisfactory service of these cars for years in the hands of private owners and in contests of nearly all kinds, in which foreign-built cars have participated, or, for some reason best known to their backers, not been entered.

As an example of the superiority of the American car in hard usage, as is well known, the Thomas, an ordinary car selected from stock, was the winner of the race around the world. The Locomobile won the recent Vanderbilt Cup Race, in which representative foreign cars were entered. The Pierce Arrows, as well as other Association cars, have for year made perfect scores in the Glidden tour. The Franklin holds the time record for trips by automobile across this continent. Recently a Packard touring car was driven from the Pacific Coast here, by a gentleman who was accompanied by several members of his family, including the women. Two women alone have crossed the United States in a Waltham buckboard. This list of accomplished marked achievements by Association cars could be much added to.

If it had nothing else to recommend it but its time-saving and health-giving attributes, the automobile would be a permanent institution. But it is as a vehicle of commerce that it is to figure more prominently in the future. The world wants labor-saving devices; the automobile is one. Manufacturing plants find hauling their product with motor cars economical from every standpoint. The automobile is becoming a part of every well-regulated municipality in the health and fire branches of the public service. We often see cases of self-propelled vehicles coming back from fires, meeting the horse-drawn vehicles of the fire department going out. The Federal Government is converted to the utility of motor vehicles.

In isolated sections of the country, far from the beaten paths, the miner and farmer use the horseless vehicle.

The United States produces annually something like 80,000 automobiles, while France produces about 40,000 and Italy 25,000. Germany is another producing nation. Taking the average price of cars produced in the United States, as low as $1,500, it is seen that the aggregate annual output of cars in the country is well over a hundred million dollars, figures which place the automobile industry of the United States in a class by itself.

Although the twelve months ending November 1 represented a period of tremendous business depression throughout the entire country, affecting in particular all manufacturing enterprises, a comparison of the figures of the previous year showed clearly that the slightly decreased volume of good business is due to conservatism rather than a falling off in demand for cars. Furthermore, the decrease appears in total value of sales rather than quantity of cars sold; the aggregate sale of Association cars being within 500 of the total for the preceding year.

CONCERNING THE A. L. A. M. HORSEPOWER FORMULA

By G. H. GODLEY.

THE horsepower formula adopted by the Licensed Association last year met with such a favorable reception from both makers and users of automobiles that its continued use is assured. Before its appearance there had been a long-felt need for some connecting link between the size and probable capacity of various motors and the more or less imaginative ratings of their manufacturers. Between the "French rating," and the double rating, and the maximum rating, and the plain American rating, it was impossible to get a clear idea of what any motor could do, and a formula which offered an easy means of comparison was hailed with delight.

Most of the objections to the A. L. A. M. formula are based upon the idea that it is intended to determine once and for all the power which a given motor is capable of developing. Any such claim or expectation is on the face of it ridiculous. The horsepower of a gasoline motor cannot be calculated from its dimensions by any formula whatsoever, no matter how intricate and learned in appearance. As well try to calculate from a scale drawing the number of cubic inches of iron in a complicated cylinder casting, when the result could be obtained by weighing the casting itself. The way to find the actual horsepower of a motor is by brake test; but as this is hardly practicable for the average man, the next best scheme is to find some simple means of comparison based on dimensions. This is the purpose of the A. L. A. M. formula. It is essentially not a dogmatic statement, but rather a ratio. If we had two four-cylinder motors, one of 4-inch bore, the other of 5-inch, we might say that the power of the first is to the power of the second as 16 is to 25. That would be simple, but rather abstract. The A. L. A. M. formula would say that when the first develops 25.6 horsepower the second develops 40. That is almost as simple, much more intelligible, and still sufficiently accurate for every-day use.

Another cause of trouble is the rather formidable-looking decimal fraction often involved by the formula, as in the "25.6 horsepower" above. This, say the opponents, is not only cumbersome, but misleading, in that it would indicate a much higher degree of accuracy than is warranted by the facts. True enough; and most manufacturers using the formula have yielded so far as to drop the objectionable fraction altogether, or to use instead the nearest whole number. Yet it seems that the fraction has some excuse for its existence, in that it shows unmistakably that the rating is by the formula, and not the usual piece of guesswork. For this very reason the writer would even favor the addition of a cipher when the result does happen to be a whole number, as "40.0 horsepower" for "40." This, however, is unimportant, and will be decided best by usage.

After the theorists have given up the idea of absolute accuracy it is easy to see that the quality really the most desirable is simplicity. Here the A. L. A. M. formula has an unquestioned advantage. It would be impossible to simplify it any farther and still retain the least approach to a horsepower rating. There are, however, one or two short cuts which might not appear to the hurried user. For instance:

$$H.P. = \frac{D^2N}{2.5} = .4\ D^2N$$

(D is the cylinder bore in inches, N the number of cylinders.) It is much easier to multiply D^2, N and 4 together and then mark off one decimal place than to divide by 2.5. For the metric system (D in millimeters) the formula becomes

$$H.P. = \frac{.00155\ D^2N}{2.5} \text{ or simply } .00062\ D^2N$$

Still further convenience may be obtained by the use of a table such as the accompanying one, especially for fractional values of the bore. The table is in the main self-explanatory, but a few features may be pointed out. The values given are so close together that intermediate values may be found by interpolation, as in trigonometric and logarithmic tables. Thus: 4 1-16 is half way between 4 and 4 1-8; and consequently the power of a four-cylinder 4 1-16-inch motor may be taken half way between the values for 4 and 4 1-8 inches, that is 26.4 horsepower. As horsepower by the formula is proportional to the square of the bore, doubling the bore multiplies the power by four, and halving it divides by four. Applying this to the table, the power of a 2-inch cylinder will be one-fourth the power of a 4-inch, or 1.6 horsepower; and the power of a four-cylinder 7-inch motor will be four times that of a 3 1-2-inch, that is, 78.4 horsepower. Again, the position of the inch and millimeter values opposite each other gives a ready means of translating millimeters into inches.

As a final criticism of the formula, and a warning against its too-confident use, it will suffice to say that it tends to overrate small motors and underrate large ones. This really makes little difference, for no one is as interested in a close comparison of a 3-inch and a 6-inch motor as he is in ones of more nearly the same size; and within the variation of an inch or so in the bores the formula is very reasonably accurate.

TABLE OF A. L. A. M. RATINGS.

BORE (Inches)	One Cyl.	Two Cyl.	Four Cyl.	Six Cyl.
3	3.6	7.2	14.4	21.6
3 1/16	3.9	7.8	15.6	23.4
3 1/8	4.2	8.4	16.9	25.3
3 3/16	4.6	9.1	18.2	27.3
3 1/4	4.9	9.8	19.6	29.4
3 5/16	5.3	10.5	21.0	31.5
3 3/8	5.6	11.2	22.5	33.7
3 7/16	6.0	12.0	24.0	36.0
4	6.4	12.8	25.6	38.4
4 1/16	6.8	13.6	27.2	40.8
4 1/8	7.2	14.4	24.9	43.3
4 3/16	7.7	15.3	30.6	45.9
4 1/4	8.1	16.2	32.4	48.6
4 5/16	8.6	17.1	34.2	51.3
4 3/8	9.0	18.0	36.1	54.1
4 7/16	9.5	19.0	38.0	57.0
5	10.0	20.0	40.0	60.0
5 1/16	...	....	42.0	63.0
5 1/8	...	....	44.1	66.1
5 3/16	...	....	46.2	69.3
5 1/4	...	....	48.4	72.6
5 5/16	...	....	50.6	75.9
5 3/8	...	....	52.9	79.3
5 7/16	...	....	55.2	82.8
6	...	....	57.6	86.4

BORE m.m.	One Cyl.	Two Cyl.	Four Cyl.	Six Cyl
75	3.5	7.0	13.9	20.9
80	4.0	7.9	15.9	23.8
85	4.5	9.0	17.9	26.9
90	5.0	10.0	20.1	30.1
95	5.6	11.2	22.4	33.6
100	6.2	12.4	24.8	37.2
105	6.8	13.7	27.3	41.0
110	7.5	15.0	30.0	45.0
115	8.2	16.4	32.8	49.2
120	8.9	17.9	35.7	53.6
125	9.7	19.4	38.7	58.1
130	...	....	41.9	62.9
135	...	....	45.2	67.8
140	...	....	48.6	72.9
145	...	....	52.1	78.2
150	...	....	58.8	83.7

Values are given to the nearest tenth. Interpolation is accurate between all values.

Horsepower Rating and Horse Sense.—Empirical formula will avail up to a certain point and within certain explored limits. In a motor, for illustration, the formula will work very well indeed if the bore is within the domain found to conform to the conditions which rendered the formula feasible. It is benerally found that motors of a bore above six inches, and upward, render the use of the formula difficult. Bores below four inches may afford a divergence of power.

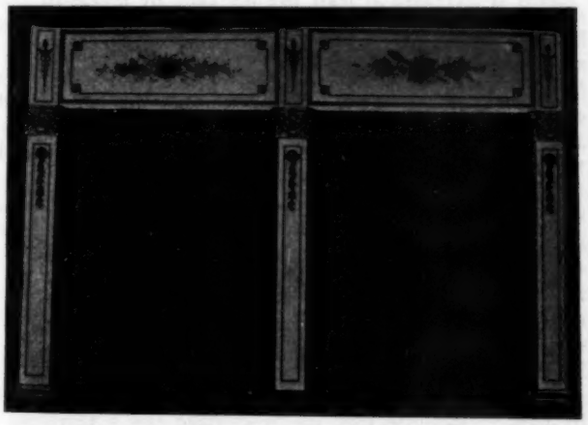
HOW ONE MAKER SUPPLIES ARTISTIC LUXURY

SOME two years ago the George N. Pierce Company established an art department whose activities were to be confined almost entirely to the interior decoration of cars and the working out of color schemes.

It was apparent that the time was coming when such a department would be necessary. When the sedan chair was first thought of as a means of transportation, the activities of the makers were concentrated first on making a chair that would be practical and comfortable.

Panels of Pierce Great-Arrow Louis XVI Car.

This they accomplished, and then began the period in sedan chair history when the best artists of the time when they were in vogue were engaged to decorate them. The same was true of the great coaches that were used so generally during the latter kingly reigns in France. The

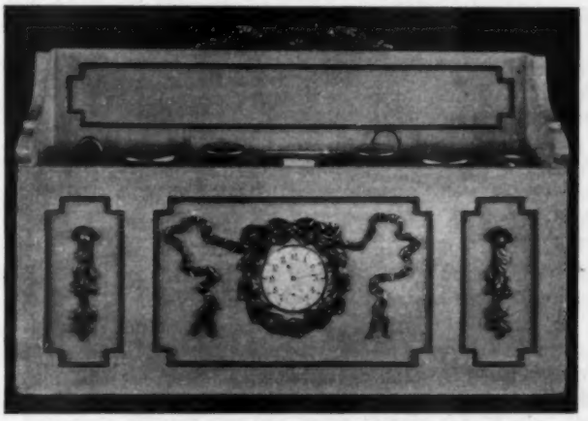


Left Side Decoration of Louis XVI Car.

first coaches were small, unwieldy and uncomfortable. Coach building progressed, however, and when the best methods of construction had been developed the taste of the users turned to their decoration. In both of these instances three epochs marked the progress of the carriages from the first rather bungled affair to the last stage. First came the utility vehicle along, and coincident with it the spread of ideas as to its users. Second came the mechanical perfection of the vehicle, and, lastly, its decoration and appeal not only to the intensely practical, but to the sense of the artistic also.

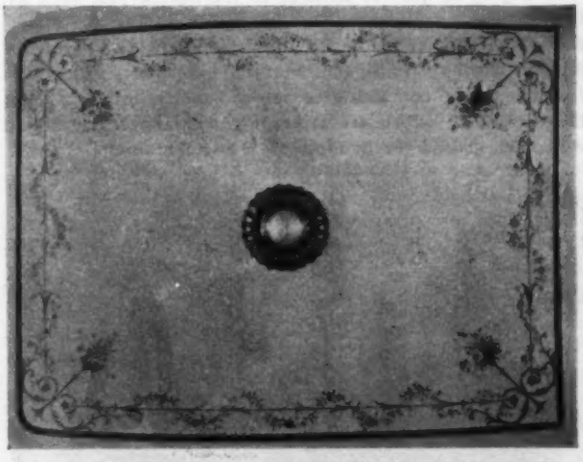
This, so far, has been the progress of the automobile. As soon as a practical machine had been made, new uses for it were found. Then came the stage when the energies of automobile men in general were centered on the mechanical perfections of the car as a whole. Comfort in the shape of bodies, the fashioning of springs and the depth and quality of upholstery has been made a study, it is true, but these matters, when compared with the possibilities of this new epoch, may also be classed as a part of the refinement of the car from a mechanical standpoint.

Last year visitors at the Garden show will remember a Pierce Arrow enclosed car, finished in Cordovan leather, hand tooled, was displayed. In view of the developments in interior decoration that will be on display at the 1909



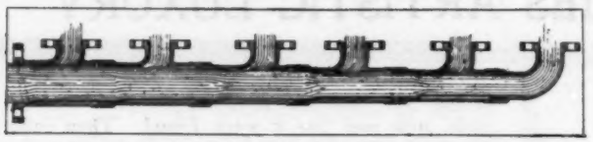
Artistic Toilet Box of Louis XVI Car.

show at the same place, it may well be judged that the designing and display of this car was meant as a test of the reception the public would give this new step in automobile construction. That the reception was one that proved satisfactory in every way is a certainty, since the



Beautiful Ceiling of the Palatial Great-Arrow.

company, this year, will show a far more pretentious product of its art department than the car of the year previous. This is nothing less than a six-cylinder 60-horsepower suburban car, the interior decoration of which is in historically correct Louis XVI style, Herewith is the description from the company:



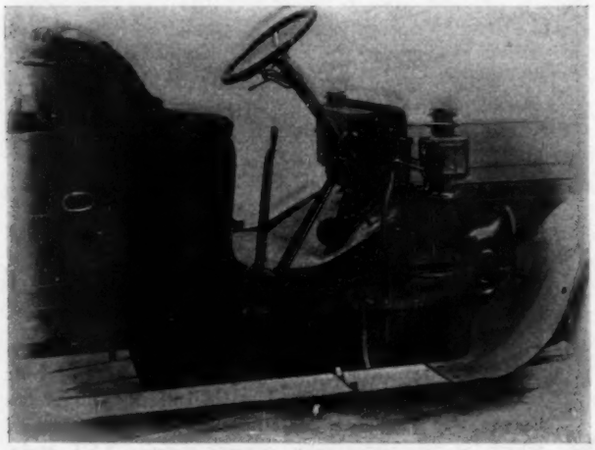
Designer Fergusson's Latest Exhaust Arrangement.

"The outside color scheme of this car is green and gold, forming a fitting encasement for the delicate interior. Satinwood, toned to a soft, golden yellow, has been used for all the exterior woodwork, includnig the dashboxes, steering wheel and the roof of the chauffeur's deck. The roof of this deck is said to be one of the most perfect specimens of this rare wood that has ever been found.

"Beginning with the fitments at the door, one is gradually prepared for the exquisite color plans and metal design that awaits within. The handles of the doors, the outside side lamps, the escutcheon covering the locks, and even the tiny head of the door keys are authentically Louis XVI in design and treatment. All of the metal mounts are in brass, exquisitely chased and heavily gold plated, and finished in the traditional ormolu style. From the dove-gray of the carpet the eye is led upward in a growing crescendo of color and ornament that reaches its climax in the magnificence of the ceiling, with its encircling ornament of ormolu and running design of slender acanthus entwined with garlands of flowers, all painted in the most fascinating colors on a ground of soft gray enamel. The central portion of the ceiling is enriched with an ormolu dome-lamp of the acanthus motif.

"A frieze of separate panels, each one falling just above a window form a pleasing accessory to the ceiling. The center panel of each bears a painted decoration complete in itself, yet united to its companions by the balance of mass and tone, although the motif is changed in every instance, in this manner bearing out both example and tradition of the Louis Seize period. This frieze is borne aloft by a row of slender pilasters that also serve as a separation and guide for the window frames.

"The upholstery is of a silk stripe of gray and yellow enhanced with long garlands of roses through the center of the gray stripe. It extends to the ceiling just back of the rear seat, and forms the decoration for all the lower portion of the car below the line of windows. The under portion of the front panel bears a toilet box, gracefully fashioned and containing a set of dainty toilet articles the designs of which are in keeping with those that might well have graced the boudoir of Marie Antoinette. These also are decorated in pure Louis Seize style and add the final touch to the elaborateness of the detail which goes to make this car a logical and fitting example of the possibilities that will be developed in even the early days of this new epoch on which the automobile industry is just entering."



Illustrating Pierce Adoption of Side Lever Control.

Owing to the fact that the space it could obtain at the Garden was necessarily restricted, another car designed by the art department of the Pierce company will be displayed at the rooms of the Harrolds Motor Car Company, in West Fifty-fourth street. This car is a striking example of the possibility of marquetry work as applied to the interior of the enclosed bodies. It is finished in Circassian walnut, with inlays of colored and stained woods. Taken together the two cars represent almost the two extremes of the possibilities of interior decorations for cars. Between them is a huge field in which the lover of things beautiful might range in his desire to suit the individual taste. In period decoration there is the widest field of all. In the possibilities of marquetry and woods it would be hard to find a limit. This is true, also, of leather. The monks of Cordova with their generations of knowledge left us the secrets of tooling and staining, while the artisans of to-day stand ready to give their Venetian velvets and brocades, full use of which has been taken advantage of in closed body work.

Two Pierce Mechanical Innovations.

Apropos of the mechanical features of the Pierce, it is to note an exhaust manifold herewith illustrated which has the advantage of stability, incidental to the great main principle: the facility of scavenging the motor. This takes advantage of the vortex of an eddying spiral formation in the exhaust as it exudes from the ports and is shaped by means of the walls of the manifold, which are so designed as to set up this spiral formation in the body of the exhaust gases. It is claimed that the power of the motor is increased at least five per cent. by means of this manifold, the shape of which is responsible for the vortex rings.

A glance at the other mechanical illustration discloses the new Pierce control system, which is in full accord with the spirit of the times and takes advantage of the manner in which fine materials may now be fashioned into desirable shapes. This allows of the easy manipulation of the car. The transmission is of the selective genera, and includes four speeds, now regarded as of the greatest importance in a car of the most advanced type of construction.

A. A. A. SCHEDULE FOR SHOW WEEK.

Headquarters will be established by the American Automobile Association in Madison Square Garden during show week, its space being located in Concert Hall, near the executive offices of the show management. These are the meetings which are scheduled during the week:

Wednesday, January 20, 2:30 P. M.—Meeting of the A. A. A. Executive Committee, President William H. Hotchkiss presiding.

Thursday, January 21, 10:30 A. M.—Directors meeting New York State Automobile Association, President Oliver A. Quayle presiding.

Thursday, January 21, 2:30 P. M.—A. A. A. Touring Information Board, Chairman Powell Evans presiding.

Friday, January 22, 10:30 A. M.—A. A. A. Good Roads Board, Chairman C. Gordon Neff presiding.

Friday, January 22, 2:30 P. M.—Conference of A. A. A. Club and State Association Secretaries, National Secretary Frederick H. Elliott presiding.

Saturday, January 23, 10:30 A. M.—A. A. A. Legislative Board, Chairman Charles Thaddeus Terry presiding.

HOW THE CARS ARE LUBRICATED

SEVERAL examples of the sump or crankcase reservoir system exist in the Licensed ranks, among which can be noted Pierce, Knox, Chalmers-Detroit, Palmer & Singer, Columbia, Pope-Toledo, Stearns town car, and others. In two of these, Pierce and P. & S., splash lubrication within the crankcase is not used, the oil being fed direct to all bearing parts and no oil level maintained within the crankcase. In the other examples of sump lubrication the crankcase splash is used in conjunction with the feed to bearing parts. All agree in that the oil is circulated through the motor parts and again recirculated, being filtered once during each cycle.

In the Pierce system the leading characteristic is the oil supply being carried in the sump beneath the crankcase and the crankcase bottom sloped towards the center, so that oil falling in it is immediately drained into the sump. The gear pump driven from the camshaft elevates the oil to a large tank carried well above the cylinder heads, and from this a lead passes direct to each of the crankshaft bearings. From these bearings the oil passes through the drilled crankshaft to the lower bearings of the connecting rods, whence any overflow falls into the crankcase or is thrown into the cylinders in the form of a mist through the slot in the baffle plate, closing the lower end of the cylinder to prevent an excess of oil getting on the walls. This mist not only cares for the cylinder walls, but also oils the wristpin bearing.

It is interesting to note that in connection with the leads from the oil tank to the bearings, that although the interior diameter of the leads are all the same, the oil does not flow through these at the full capacity of the leads, but is regulated by thimbles inserted in the upper ends of the leads where they enter the oil tank, and in each thimble is a small opening which allows only a limited amount of oil flowing. The size of the openings in the thimbles is varied in proportion to the quantity of oil needed, one bearing feeding more than another. In this system a few quarts of oil are poured into the oil tank, if the system is empty, which in tests has proven sufficient for many miles. On the small motors a wide space at the center of the piston is turned down to a slightly less diameter than the body of the piston, which prevents surplus oil reaching the combustion chamber. A paradoxical feature of the Pierce lubrication is the effort made to prevent a surplus of oil getting past the piston into the combustion chamber. First to stop it the baffle plate is used, then the broad groove in the piston and lastly the fact that a splash is not maintained, and consequently a less quantity of oil than ordinary is splashed into the cylinder.

On the Knox Motors.

On the Knox motors is a conventional sump system with the gear oil pump located outside of the sump on a vertical shaft at the right rear and driven by spiral gears from the camshaft with the timer on the top of the shaft. The pump elevates oil into a horizontal passage cored into the top part of the crankcase, and from this are oil leads to each of the three crankshaft bearings. The oil does not overflow from these into the crankcase splash, but first reaches the lower connecting rod bearings and later the wristpins. From the crankshaft bearings it is conducted to the lower connecting rods through the drilled crankshaft, which has a radial hole in the main bearing parts which registers once each revolution with the oil lead from the pump. The connecting rods have a 1-4-inch tube running the entire length to the wristpin, the bottom end of this tube registering with the hole in the crankpin, through which the oil escapes from the drilled crankshaft. No oil grooves are employed at the bottom of the piston, but a compression ring is fitted at this part of it. An oil pressure of from two to four pounds, varying with the different models, is used, which is claimed to be sufficient to force the oil to all of the cylinder motor bearings, and the mist from the overflow of which oils the cylinders.

In conjunction with the oil pump system is an adjustable by-pass controlled by spring pressure which maintains the oil pressure at any fixed point between one and six pounds. This by-pass, as well as the leads to the connecting rods, is provided with a small screen, which guards against dirt entering, and a large, fine screen has recently been added in the crankcase base, through which the oil strains before going to the pump. The use of baffle plates in the lower ends of the cylinders prevents an excess of oil reaching the walls.

In the Chalmers-Detroits.

The Chalmers-Detroit "Forty," as well as the "Thirty," employs the sump or crankcase oiling system, the only difference between the two being that in the "Forty" the gear oil pump is driven off the lower end of the timer shaft mounted vertically at the rear end of the motor and in the "Thirty" it is driven off the rear end of the camshaft. In both models the oil is elevated from the sump or reservoir beneath the crankcase through oil leads to the crankshaft bearings, whence it overflows, maintaining a splash in the crankcase proper. In order to insure a goodly quantity of oil reaching the crankshaft bearings, pockets are provided in the case above them which are filled from the splash and from which the oil flows into and through the bearing.

Two schemes are used for oiling the lower connecting rod bearings: First, the connecting rod caps are cut away at the bottom, so that the crankshaft is exposed to oil when the caps dip into the splash; and, second, oil holes are drilled in the connecting rods at the lower ends parallel to the webs, so that the oil which is splashed against them and flows down them enters these holes and is led to the bearing. For lubricating the cylinder walls the splash is relied upon, and oil grooves on the lower ends of the pistons are used. The wristpins in the "Thirty" are lubricated from the cylinder walls, the oil on these running into the end of the hollow wristpin which is anchored to the piston. The wristpin is drilled radially to let the oil into the bearing in the connecting rod. In addition oil holes are drilled on the top of the connecting rod, which are filled from the splash. On the "Forty" the wristpin is gripped in the top of the connecting rod and has a bearing at each end in the piston boss, and to lubricate these the oil from the cylinder wall enters the hollow pin and is led by radial holes to the bearing surfaces. Baffle plates are not used

over the open ends of the cylinders. As a check on the oiling system, all of the lubricant pumped must pass in a constant stream through the sight feed on the dash, visible to the driver, and should this flow cease it is instantly detected.

The Packard system is unique because of its simplicity and individuality. In brief, it consists of two plunger pumps pumping oil by way of sight feeds on the dash to the two crankcase compartments, one to the forward compartment, the other to the rear compartment. These plunger pumps take their oil supply from a vertical cylindrical tank located on the left side of the motor in the open angle between the front and rear cylinder castings, where the oil is maintained at a uniform temperature. The two pump plungers are driven from the camshaft, and have adjustable strokes, permitting of the utmost regulation of the amount passing to each compartment, in which an independent oil level is maintained. In each compartment is a petcock for determining the oil level.

Of the many cars using a mechanical oiler with its bank of pumps, one pump for each oil lead, much diversity exists as to where the oiler should be located and where the oil leads should pass. The old method of carrying the oiler on the dash, where it was at the mercy of the weather to thicken the oil in cold days and thin it on hot days, is almost obsolete. The majority place the oiler on the exhaust side of the motor, some set it on the rear motor arms, and Haynes and Stearns continue, for the second season, their policies of incorporating it in one of the forward motor arms, where it occupies very little room. Last year the Locomobile cars carried it under the floor boards at the left, but this season it is placed under the bonnet.

The Haynes system is typical of this mechanical multi-feed oiler class. The five-feed mechanical oiler mechanism is set in a case in the right front motor arm and the left front motor arm is an additional oil well from which the oil flows through a duct cored in the crankcase to the oiler reservoir. Four oiler leads go to the cylinders and the fifth to the crankcase, the four to the cylinders delivering the oil directly against the pistons.

The mechanical oiler in the Franklin motor has separate leads to the crankcase compartments, in which are small oil pockets beneath each connecting rod, in which an oil level is maintained. The crankshaft bearings, lower connecting rod bearings and wristpin bearings, as well as the cylinder walls, are all oiled by splash. The crankshaft is not drilled, oil grooves are cut in the pistons, but baffle plates are used on the open ends of the cylinders to avoid too much oil splashing in them.

In the Peerless cars the oil reservoir is incorporated in the crankcase, at the back side. The oil is pumped from the reservoir, through four sight feeds on the dash, and thence to the four cylinders. In the four-cylinder motors the crankcase has two compartments and three in the six. In addition to this mechanical oiler, a hand pump is arranged whereby the oil can be injected direct into the crankcase compartment. The crankshafts are not drilled, but oil grooves are cut in the pistons, and by the use of hollow wristpins the oil fed to the cylinders finds its way to this pin through the piston bearings.

In the Stevens-Duryea motors the multi-feed and mechanical oiler is carried under the bonnet, and the leads run direct to the motor parts. The internal lubrication of the motor is by splash, the crankshaft not being drilled, but a compression ring is used at the bottom of the piston, whereas, the regular compression rings are located at the head of the piston above the wristpin.

In the Locomobile motors, the mechanical oiler is located under the hood, and feeds direct to the motor parts. The main bearings of the crankshaft are fed from oil pockets filled by the splash, the ten bearings of the two camshafts are similarly oiled, and the lower connecting rod bearings get their quota of lubricant through the drilled crankshaft. Oil grooves are not cut in the piston, baffle plates are not made use of, and the wristpin is oiled through a horizontal groove cut in each cylinder near the bottom. This groove is always well filled from the splash, and when the piston reaches the bottom of the stroke, the oil in the groove enters the hollow wristpin at each end, and by the usual drilled holes reaches the bearing.

In the two-cycle Elmores the mechanical oiler forces the oil into the intake in the form of a spray, and the mixture passing through the crank chamber and thence into the combustion chamber lubricates all parts. In addition to this there is an oil lead to each of the crankshaft bearings. A compression ring is used near the bottom of the piston, and the wristpin has a cup in the forging which collects a supply of oil, which enters the bearing. There is also an accumulation of oil in the crankcase and the cap on the connecting rod, which dips into it, is provided with a scoop which gathers the oil.

In the White steam cars an oiler is located on the dashboard, which is driven by means of a ratchet from the valve mechanism on the engine. This oiler consists of two independent reservoirs, each supplied with a pump. One of them feeds into the crankcase, and the other into the steam chest. The oil entering the steam chest is carried along by the steam through the engine, being deposited not only on the walls of the two cylinders, but on the valves as well. Any excess oil is carried through into the condenser with the exhaust steam and is returned to the water tank, where it may be fluffed off when filling the tank with water. The crankshaft bearings are of the ball type, and are lubricated by the splash system, as are the crosshead pins.

The Stearns system includes a Lavigne oiler in the front motor arm, from which a separate oil pipe leads to near the base of each cylinder, whether of the four or six type. On the lower ends of the connecting rods are forged lugs which are machined out for an oil lead to force the oil to the crankpin. In addition to this is an oil hole on the top of the bearing, which is filled from splash. The wristpins are oiled solely by the splash system, there being a hole in the top of the connecting rod to collect the splashed oil and a groove along the wristpin to distribute it throughout the length of the bearing. Oil grooves are turned in the piston at the lower end and a compression ring is used near the center of the piston. The crankshafts are not drilled, and baffle plates are not used on the open ends of the cylinders.

Winton six-cylinder motors are lubricated by a double pump scheme, one pump which forces oil to all of the crankshaft bearings as well as to the crankcase compartments, and another pump which again delivers this oil back to the tank from which it was first drawn, thus permitting of the circulation and recirculation of the oil with the usual filtering between successive circuits. The main oil reservoir is located on the left side of the motor base. A double-acting plunger pump draws oil from this tank and delivers it through leads to the four bearings of the crankshaft and the three cylinder compartments. The surplus from these bearings falls into the splash, which, instead of being allowed to increase, is drained off by a collector tube to a oil well, from which it is drawn by the pump and returned to the tank. With this system the crankcase is comparatively dry, the lower connecting rod bearings are oiled by drilling the crankshaft and the cylinder walls and upper wristpins by the splash from the overflow of the connecting rods and what oil may be picked up from the crankcase.

Aerial Flight Excites Attention; Land Transit Commands Interest

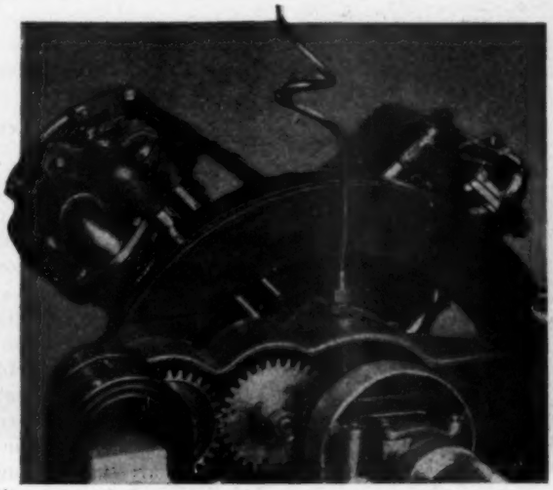
By W. F. Bradley

The Second Paris Salon, Wherein the Commercial Vehicles and Aeronautical Exhibits Divided Attention.

PARIS, Jan. 7.—Aeroplanes, although occupying but one-third of the Grand Palais, completely overshadowed the commercial vehicles in the second section of the Paris Salon. Talk of flying is in the air; the crowds came to see the aeroplanes, and came in such numbers that a couple of policemen were needed every day to protect the Wright machine from the mass of sightseers. Round about, where all types of utility automobiles were exposed, there was room and to spare, for trucks and taxicabs were not the subject of the hour.

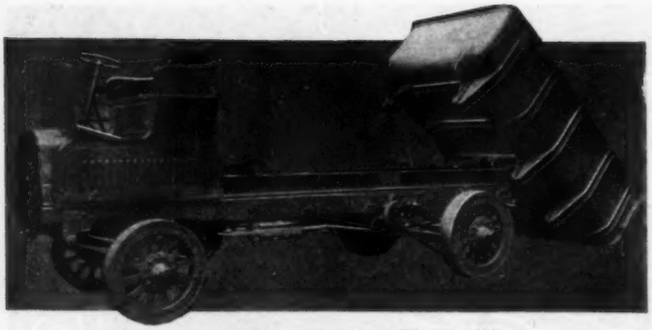
Commercial vehicles have not the charm of novelty, though they are not lacking in interest to those who have taken the trouble to follow such movements. New departures are somewhat rare, and at this time of the day, indeed, it would be rather difficult to get an altogether new system on the market unless it possessed obviously superior qualities. Steam had a lesser representation than ever before, and at the show appeared to be less important than it really is, for Darracq-Serpollet and Purrey, the two most important French firms in this line, were absent from the Salon. There was one newcomer in the Johnson, a French production with British capital behind it, and another one in a steamer for the Renard Trains Company. The only other steam vehicles in the show were shown by the Chaboche Company.

A rotary air-cooled motor using solid blocks of napthaline as fuel was one of the few novelties at the Salon. The motor itself is not entirely new, being a Burlat which has occupied a position on the market for the last two years. The cylinders are disposed in the form of a cross, with pistons connected up to a two-throw crankshaft. For starting up it is necessary to use gasoline, and continue running on it for about ten minutes before switching over to napthaline. During this period the exhaust gases are being led through a pipe forming a jacket round a tube passing through the napthaline tank. At a heat of 176 degrees Fahr. the solid block of napthaline liquefy, the liquid being led down the jacketed tube to the carbureter and treated in practically the same way as gasoline. To carburate it, however, the liquid must be still further heated, and on this account all the intake piping is jacketed to receive the heat of the exhaust gases, napthaline only vaporizing at 302 degrees Fahr. and boiling at about 390 degrees Fahr. When the engine has become sufficiently warmed up to vaporize the liquid, the driver switches over by merely carrying the throttle further round on the sector, one-half of which gives his full range for gasoline, and the other half for running on napthaline. The act of opening out the napthaline supply closes off the gasoline flow.



Burlat Four-Cylinder Rotary Engine.

Lower cost of running is claimed for the napthaline engine, the difference being said to be as great as 60 per cent. The method of converting



The Delahaye Type of Heavy Tip-Up Wagon.

napthaline into a solid block is one that is kept secret by the constructors of the rotary motor. It is declared, however, that the blocks do not consist of pure napthaline, it being possible to incorporate other hydrocarbons with it without any deposit being left. The engine and its special fuel have been produced by the Société des Camions à Moteur Rotatif, of Lyons.

An interesting feature of the truck fitted with a rotary motor was the method of suspension, all the organs, comprising engine, clutch, gearset, and countershaft, being mounted on a subframe attached above the main frame by inverted semi-elliptic springs in front and a single coil spring at the rear. The suspension of the mechanism was thus at all times independent of the main springs, whatever the load carried. Delahaye also made special provision for easy suspension of the motor and transmission on all trucks by employing two sets of springs all round, a lighter set being placed immediately above a much heavier set. When running empty the weight of the vehicle was carried entirely on the upper and lighter springs, the lower and heavier ones only being brought into operation when the vehicle was under load. Experience has shown that a five-ton truck, with sufficiently powerful springs to carry that load, is very destructive of machinery when run light at an increased speed, hence the attempt to give two sets of springs, one for light traveling and one for full load.

Distinctive Type from Switzerland.

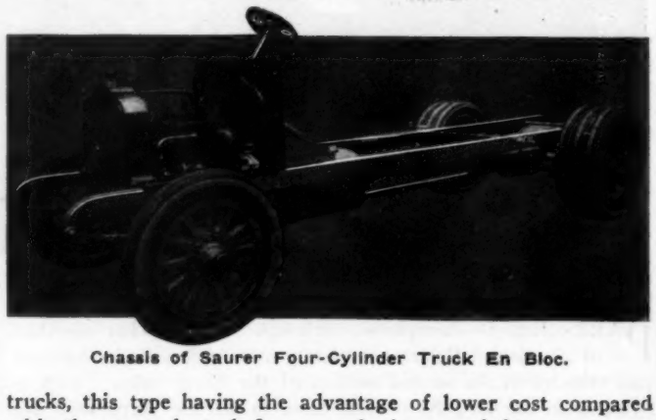
A distinctive type of commercial vehicle was shown by the Stoller Company, of Basle, Switzerland, the motor consisting of a single cylinder horizontal with opposed pistons, connected up to the crankshaft carried below the pistons and in the horizontal plane of the vehicle. The method of connecting is by balance levers and three connecting rods. The combustion chamber is an outstanding port midway in the cylinder, with an exhaust valve in the head and an inlet valve in the base of the chamber. Engine dimensions are 7 4-5 inches diameter by 5 7-10 inches stroke for each piston, the total stroke, of course, being double this. Ignition is obtained by a low tension magneto.

Renault Bus with Michelin Twin and Triple Tires.

The two-cylinder engine being placed across the forward end of the frame, the radiator being to the rear of it, accessibility is perfect. In the forefront of the engine is a horizontal shaft carrying the cam operating mechanism, the gears for driving the lubricator and water pumps, and the governor, all laid bare by removing a single inspection plate with bayonet clasps. Further, the connecting rod ends could be got at by the removal of a plate at each end of the cylinder. From a metal to metal cone clutch the drive is taken to a six-speed gearbox, with gears always in mesh. A feature of this is that the same six forward speeds can be used for the reverse, there being a right and left crown bevel on the countershaft, forward and rear drive being given according to which bevel is slid into mesh. Final drive is taken to the rear wheels by means of side chains.

Speed being the most destructive factor in commercial vehicles, there has been a serious attempt on the part of constructors to make it impossible for drivers to travel above a certain fixed rate. Governors cutting off the gas supply when the engine has reached a determined number of revolutions were a feature of about three-quarters of the heavy vehicles in the show. On the Saurer trucks there are two engine speed limitations, a high one when the vehicle is being run on any of the low gears, and a lower one as soon as the driver slips into top direct drive. When running on the high the driver has only half the gas supply available with the engine in low gear.

Girder frames are a distinctive feature on all the heavier



Chassis of Saurer Four-Cylinder Truck En Bloc.

trucks, this type having the advantage of lower cost compared with the pressed steel frame, and also permitting some very advantageous attachments of the different mechanical organs. There are three distinct types of final drive: by double side chains, by propeller shaft, and by transverse cardan shaft, with internal gearing, on what is generally known as the De Dion principle. Above two-ton loads the chain drive unmistakably holds premier position, experience having shown that the considerable non-suspended weight of a live axle car was not at all conducive to long service. As in the pleasure car class, there has been an abandonment of the low tension magneto for commercial vehicles in favor of the high tension magneto only; in the majority of cases no stand-by in the form of storage batteries is provided.

Two Cylinders Enough for "Taxies."

Taxicab experience is that two cylinders are sufficient, at any rate for the generally fair street conditions of European cities. There are plenty of four-cylinder cabs intended for the heavier work at railroad depots, but for the ordinary city work the only four at the Salon was one exposed by the Fiat Company, with a bore of 3.1 and a stroke of 3.9 inches. The cylinders and upper half of crankcase were produced in one casting. At every other stand the taxicabs on view had two cylinders carried under a bonnet forward, cooled by thermo-syphon circulation, and having high tension magneto for sole electric supply. Among these were Renault, Charron, Panhard, Berliet, Peugeot, Delahaye, Cottin-Desgouttes, Dietrich, and Unic. So convinced are cab companies of both London and Paris of the superiority of the two-cylinder cab that in all cases where both

models have been taken it is the two-cylinder vehicle that is being ordered in increased numbers to the neglect of the four. The principal reason for this choice is the lower fuel cost with the twin-cylinder car, and, in a smaller degree, the decreased cost of upkeep. The objection that anything short of four cylinders was not supple or silent has now been removed.

De Dion goes further and has been very successful in the introduction of single-cylinder taxicabs for London and Paris, the engine being a model with a bore and stroke of 3.9 by 5.1 inches, nominally rated at 10 horsepower. Being remarkably well balanced, there is no more vibration than on the average four, and in city traffic they are not distinguishable by traffic they are not at all noisy.

The Stim Tip Wagon, a Powerful Type of Commercial Vehicle.

Fire Engines Are Many.

Automobile fire engines are a well-developed class, for the authorities in all large European cities have become convinced that better work can be done by the internal combustion motor than by horses. Delahaye showed two distinct types, both of which have been adopted by the City of Paris brigade, which has recently decided to abandon all horses. The smaller engine has as its power plant a four-cylinder motor of 2.9 by 4.3 inches bore and stroke, carried forward and driving to the rear wheels through a three-speed gearset and propeller shaft. This engine, known as the first aid wagon, carries with it 90 gallons of water which can be turned onto the fire immediately the vehicle comes to a standstill, and while connection is being made to the street mains. Including the driver, only five men are needed, and the engine can get away so much quicker and work its way through city streets with so much facility that frequently it extinguishes a fire before the larger outfit gets on the scene. The rule in Paris is to send out the first aid engine when a call is made and let it be followed by the large engine a few minutes later.

On the more powerful Delahaye engine a four-cylinder motor of 5.1 by 5.9 inches bore and stroke was employed, the pump being a Farcot centrifugal type with an ability to draw water from a depth of 30 feet. With 1 1-2 tons of material on board, and fifteen men, the maximum speed on the level is 31 miles an hour. Chassis features were a girder frame, with engine carried forward, four selective speeds and a safety device to prevent slipping in the pump gears accidentally, final drive by side chains. At each extremity of the countershaft, and just within the sprockets, was carried a large size brake drum fitted with radiating flanges for carrying off the heat. The brake bands were of the internal expanding type.

Fiat had a four-cylinder fire engine established to meet the requirements of the Milan brigade, the motor being a 30-40-horsepower model driving to the rear wheels through side chains, and operating the centrifugal pump by means of a single chain geared off the mainshaft. For use in large cities, where a good supply of water could be assured, an engine is constructed with two independent motors, one being used for driving the vehicle, and the second one connected up direct to the pump. Pipe, the Belgian firm, exhibited a four-cylinder engine as used in Brussels.

"Tip" Wagons Produced in Quantity.

Tip wagons, designed for use in the building trade, and for public service works, had been produced in large quantities. One of the most interesting in this class was shown by Delahaye, the metal body being mounted on small wheels running on rails, the ends of which curved downwards at the rear. By means of a low reducing gear the truck could be wheeled out to the end of the rails and necessarily tipped owing to the curve of the rail. The double reducing gear allowed one man to operate the body even when carrying its full load of five tons. The Stim Company showed a wagon of a similar type, in which the body was carried out to the extremity of the rails by means of chain and low gearing, then tipped by a separate lever with a powerful band brake, allowing the movement to be stopped at any position. Rossel showed self-tipping wagons, the body being pivoted so that the rear would always be slightly heavier than the front under load; thus on releasing a pin the load would be dropped out behind, yet the body could be raised to its primitive position by one man.

Heavy city omnibuses have always been found a difficult class

Suburban Type of Bus for Paris, with Pneumatic Shock Absorber.

to fill, the load being great, speed comparatively high, and regularity essential. Of the types suitable for service in Paris and London there were very few examples, the only one really fitted out for this work being an Aries. The Renault Freres exposed a special bus designed for the General Omnibus Company of Paris. It was one of the single deck type, only a small number of which are kept in service in Paris, and although following standard Renault design, is special construction throughout. The frame, a very deep pressed steel channel section type, is adequately strengthened by cross members and angle members at the rear. The engine, a 20-30-horsepower type, is carried forward under the usual Renault bonnet, with plain tube radiator on the dash. Clutch, gearbox and final drive by rear live axle all follow standard design, though naturally very considerably strengthened for their special work.

Instead of being at the right, the driver is placed at the left-hand side of the vehicle, his brake and change speed levers being in the centre. The exhaust carried upwards above the roof of the bus, in the usual City of Paris style, but at the base of the vertical length of piping was a by-pass, allowing the hot gases to be turned into a foot warmer running down the floor of the bus. In place of the solid block tires usually employed on the Paris buses, Michelin pneumatics were used, triples being mounted on the rear and twins on the front wheels.

Plenty of special vehicles were shown for distinctive classes of work. Thus Delahaye had a light disinfecting van employed in the Sarthe district for cases of infectious disease, the work of disinfecting linen, bedding, etc., being done at the door of the patient's house. The same firm had an automobile hearse, with a coupé body immediately behind the driver, and compartment for the coffin at the rear. Berliet showed a special meat wagon which had been used during the last army maneuvers to supply fresh meat to an entire army corps. The chassis was a standard 22-horsepower model on which changes had been made from low to high-tension ignition, and from pump to natural water circulation. The body, a capacious one opening at the rear, was lined with metal, fitted with hooks for hanging meat, and supplied with a ventilator.

For carrying race horses from their stables to the course the Front Drive Latil Company showed one of their models with four-cylinder engine placed across the forward end of the frame, connecting up to the front wheels by means of universals and pinion engaging with internal gear on the road wheels. The absence of machinery at the rear made it possible to fit a low, easily entered body specially designed to accommodate two horses.

Military and city ambulances were plentiful, and although there was a considerable amount of ingenuity in fitting up the interior to the best advantage, the chasses employed in all cases were standard models. On a Gem light delivery van equipped with an engine built under Charles Y. Knight's patents, an attractive advertising scheme was shown in the form of luminous signs on the sides and rear. The body was made with double walls, between the two being electric lamps which lit up the glass signs placed in front of them. The application was easy of attachment to the Gem from the fact that although the motor ran on gasoline the drive was electric. This form of drive is on the increase, although not so much so in Paris as in London. It will be remembered that two such drives were shown at the Salon, Gem and V. A. T. E., the latter showing small cars with a single and two-cylinder engine driving a dynamo, which in turn furnished the necessary power for an electric motor.

This make of Gem was the only one to show the Knight engine, in which the similarity to the Salon was carried still further. This engine, which created such a furore in England previous to the Olympia Show, has attracted very little attention here, the French makers standing aloof from it and regarding it in a good deal the same way as the American, the man from Missouri, who said: "I am from Missouri; you have got to show me."

THE AUTOMOBILE CALENDAR

AMERICAN.

Jan. 16-23.....New York City, Madison Square Garden, Ninth Annual National Show of the Association of Licensed Automobile Manufacturers. M. L. Downs, Secretary, 7 West 42d St., New York City.

Jan. 19.....Adjourned Fourth Annual Meeting, Society of Automobile Engineers.

Jan. 27-Feb. 3..Philadelphia, Second Regiment Armory, Eighth Annual Show, Philadelphia Automobile Trade Association.

Feb. 6-13.....Chicago Coliseum and First Regiment Armory, Eighth Annual National Exhibition, National Association of Automobile Manufacturers. S. A. Miles, Manager, 7 East 42d St., New York.

Feb. 15-20.....St. Louis, New Coliseum Building, Third Annual Show, St. Louis Automobile Manufacturers' and Dealers' Association. John J. Behan, Chairman.

Feb. 15-20.....Detroit, Wayne Pavilion, Annual Show, Detroit Automobile Dealers' Association. E. LeRoy Pelletier, Manager.

Feb. 15-20.....Cleveland, First Regiment Armory, Annual Show, Cleveland Automobile Dealers' Company.

Feb. 15-20.....Bangor, Me., Auditorium, Eastern Maine Automobile Show.

Feb. 16-18.....Denver, Colo., Auditorium, First Annual Automobile Show, Denver Motor Club.

Feb. 18-25.....Toronto, St. Lawrence Arena, Third Annual National Automobile, Motor Boat and Sportsmen's Exhibition. Ontario Motor League. R. M. Jaffray, Manager.

Feb. 20-27.....Newark, N. J., Essex Troop Armory, Roseville Avenue. Second Annual Show New Jersey Automobile Trade Association. H. A. Bonnell, Manager.

Feb. 20-27.....Hartford, Conn., Second Annual Show, Hartford Automobile Dealers' Association.

Feb. 24-27.....Omaha, Fourth Annual Automobile Show, Omaha. Automobile Show Association. C. N. Powell, Sec'y.

Mar. 1-6.....Buffalo, Convention Hall, Annual Show, Automobile Club of Buffalo. D. H. Lewis, Secretary.

Mar. 6-13.....Boston, Mechanics Building, Seventh Annual Automobile Show, Boston Automobile Dealers' Association. C. I. Campbell, Manager, 5 Park Square.

Mar. 8-13.....Kansas City, Kansas City Automobile Dealers' Association Show.

Mar. 13-20.....Minneapolis, Minn., Annual Show, Minneapolis Automobile Show Association, F. E. Murphy, Sec'y.

Mar. 27-Apr. 3..Pittsburg, Duquesne Garden, Automobile Show. Pittsburg Automobile Dealers' Association.

Races, Hill-Climbs, Etc.

Feb. 20-22.....New Orleans, Fair Grounds Track, Mardi Gras Race Meet, New Orleans Automobile Club. Henry George, Secretary.

March 5-12.....Palm Beach, Fla., Lake Worth, Fifth Annual Regatta. Palm Beach Power Boat Association.

FOREIGN.

Shows.

Jan. 16-25.....Belgium, Brussels Automobile Exhibition.

Races, Hill-Climbs, Etc.

May 2.....Sicily, Targa Florio, Automobile Club of Italy.

May 26.....Russia, Moscow—St. Petersburg Race.

June 10-18.....Germany, Prince Henry Cup Competition.

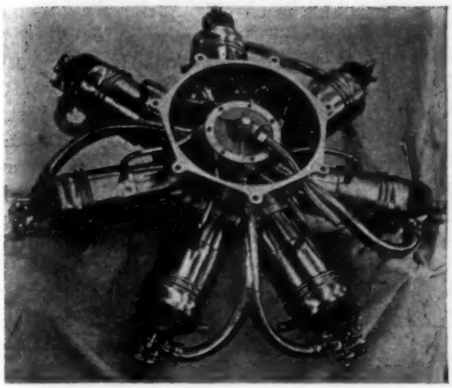
June 14-19.....Scotland, Scottish Reliability Trials.

July 1-3.....France, Angers Course, Grand Prix, Automobile Club of France.

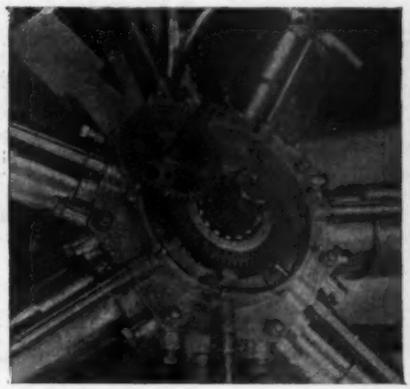
July 13-17.....Belgium, Ostend Automobile Race Week.

Sept. 5.....France, Mont Ventoux Hill Climb.

Sept. 11-19.....Italy, Bologne, Florio Cup Race, Automobile Club Bologne.



Copper Water Jackets and Pump.



Gears and Valve Mechanism.

Timer and Exhaust Tappet Rods.

Bayard-Clement 50-Horsepower Seven-Cylinder Water-Cooled Rotating Engine.

WHAT THE AERONAUTICAL SECTION UNCOVERED

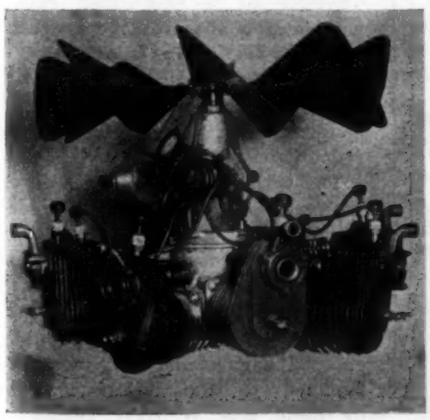
PARIS, Jan. 7.—Nine years ago, when commencing the construction of a man-carrying aeroplane on the lines of a large model which had made successful flights over the Potomac River, Professor Langley appealed to American engineers for a gasoline motor of light weight and low power. One firm undertook the task, but failed so lamentably that a visit had to be made to Europe in the hope of obtaining what was required from the leading automobile constructors. The American specification called for an engine of 12-horsepower weighing not more than 100 pounds complete with cooling water and all accessories. European constructors were asked to produce an engine not exceeding 10 pounds in weight per brake horsepower without fuel or water. They declared the task impossible, and in view of the inability to obtain an engine from established firms, construction was begun at the Smithsonian Institution. The result was a gasoline engine of 52 brake-horsepower, weighing approximately one kilogram per horsepower. European aeronauts met with the same difficulties. After being obliged to design a special steamer for the first flying machine the world ever knew, the Levavasseur compelled to defer his experiments with wings until he had produced an engine light enough.

Wonderful progress has been made since Professor Langley and his engineer visited Europe, there being at least half a dozen firms having engines of less than 10 pounds per horsepower, capable of running with as much regularity as the best of the motors fitted to road vehicles. Most of the work in this direction has been done during the past two years, or indeed during the past twelve months. The year 1908 having proved that the aeroplane is inevitably a means of transport for the near future, scores of constructors have devoted their efforts to the production of a motor suitable for use in the air. It is undoubtedly a wise policy, for already there are a sufficient number of aeroplanes under construction to make the building of light weight motors profitable, and the firm to first get a really successful engine on the market is certain of a handsome reward.

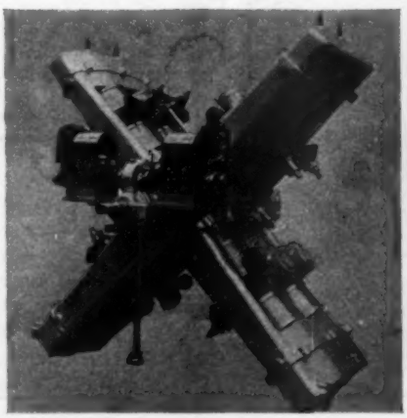
At the aeronautical exhibition there were almost a dozen different makes of aero engines, some of which have been on the market for a couple of years or more, while the majority were entirely newcomers. Roughly, the engines which were presented may be divided into two classes: Eight-cylinder "V" engines, either air or water-cooled, and seven-cylinder engines with pistons of all the cylinders connected up to a one-throw crankshaft. In the former class are Renault, Antoinette, Pipe, and E. N. V., while in the latter should be placed Esnault-Pelterie, the first builder of a successful seven-cylinder aero motor, with Gnome and Bayard-Clement as newcomers.

There is no very startling departure in design in any of the eight-cylinder engines. They are invariably built in "V," with two connecting rods linked up to each throw of the crankshaft, and a single camshaft for the entire set of sixteen valves. There is undoubtedly a decrease in weight with an engine built on these lines, for the flywheel can be cut down to a minimum or dispensed with altogether, the crankshaft need be no heavier than for a four-cylinder engine, and there is a saving of one camshaft. To get down to one kilogramme per horsepower, however with a "V" engine of this type is a science of metals, and in more than one case the paring has been carried out to such an extent that reliability of running has faded away.

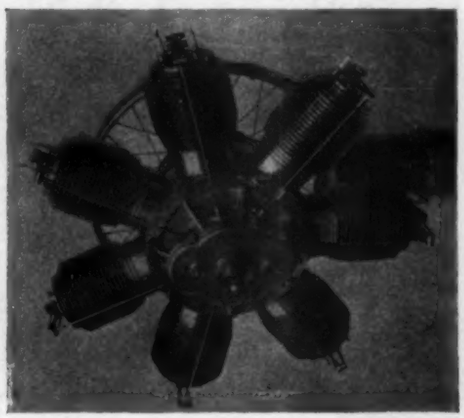
The Antoinette engine has been too often described to need



Farcot Operates Horizontally.



Cross-Shaped Gobron.



The Rotating Gnome.

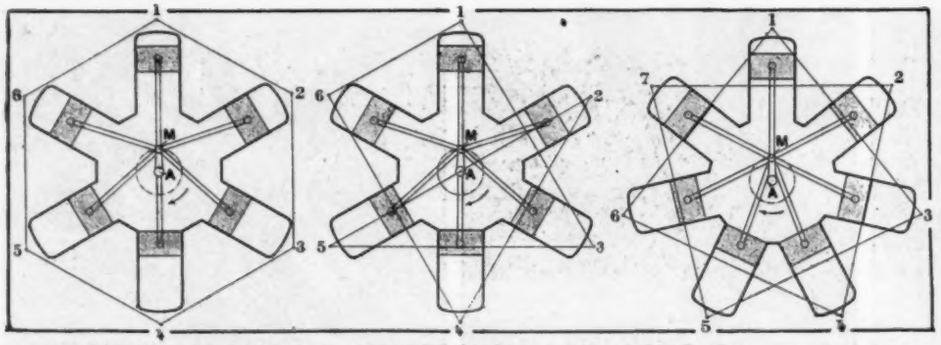


Fig. 1—Consecutive Firing Impossible. Fig. 2—Alternation also Impossible. Fig. 3—Correct Regular Spacing.

Order of Firing Six and Seven-Cylinder Rotating Motors.

repetition. Its successful use by Farman and Delagrange has shown that it can be relied upon, though now that long flights are the order of the day these aeronauts do not put their preference on the specially lightweight model guaranteed not to exceed one kilogramme per horsepower.

Since first produced, the Renault aero engine has undergone several minor changes which have tended toward its greater efficiency. Instead of two fans, one at the front and the other at the rear of the engine, there is now but one, placed on the forward end of the mainshaft, drawing in a current and discharging it at each side of the engine, after passing over all the cylinders.

Pipe Has Ball-Bearing Crankshaft.

An eight-cylinder "V" engine has just been produced by the Pipe Company, of Brussels, the distinctive features of which are a ball-bearing crankshaft; an aluminum casing round each set of cylinders, the forced draught being aspired at the base of the cylinders—the casings are bell-buttomed for this purpose—and discharged at the rear; a combined inlet and exhaust valve, and the use of hemispheric combustion chambers.

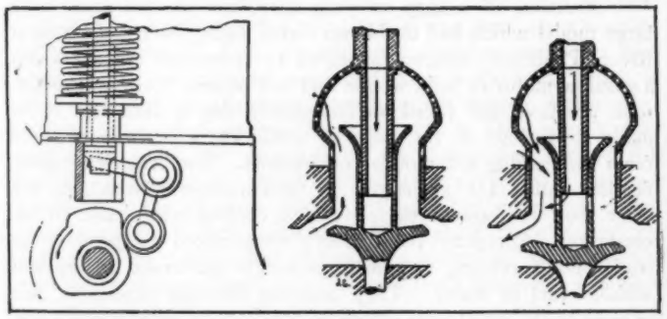
The valves are placed in the head of each cylinder, each valve being operated by two tappets, one operating the inlet and the other the exhaust. The principle is that of a double concentric valve, full details of which are being withheld until all patents are secured. The carbureter, of the ordinary car type, is carried between the two sets of cylinders, with a very neat arrangement of intake piping in the form of a double cross. The engine has a bore and stroke of 3.9 inches, and is declared to develop 70 horsepower, the total weight being 285 pounds.

An electrically deposited copper jacket is the feature which stands out on the E. N. V. eight-cylinder engine, another newcomer to the aeronautical world. Here the cylinders are placed in the usual "V" form, the pistons being connected upon a four-throw, three-bearing crankshaft, there, of course, being two connecting rods to each pin. The cylinders are cast, turned inside and out to as fine a degree as possible, then receive their water jackets by a patented method of copper deposit. The claim made for the system is a perfect union of the copper jacket with the cylinder casting, the joints being absolutely non-expanding. Another feature of the engine is a longitudinal sliding of the camshaft, in order to vary the timing at the will of the driver. A force-feed circulation, by means of a pump driven off the camshaft, is somewhat distinctive of the engine, but in all other respects standard lines are followed.

Gobron Engine Is Not "Standard."

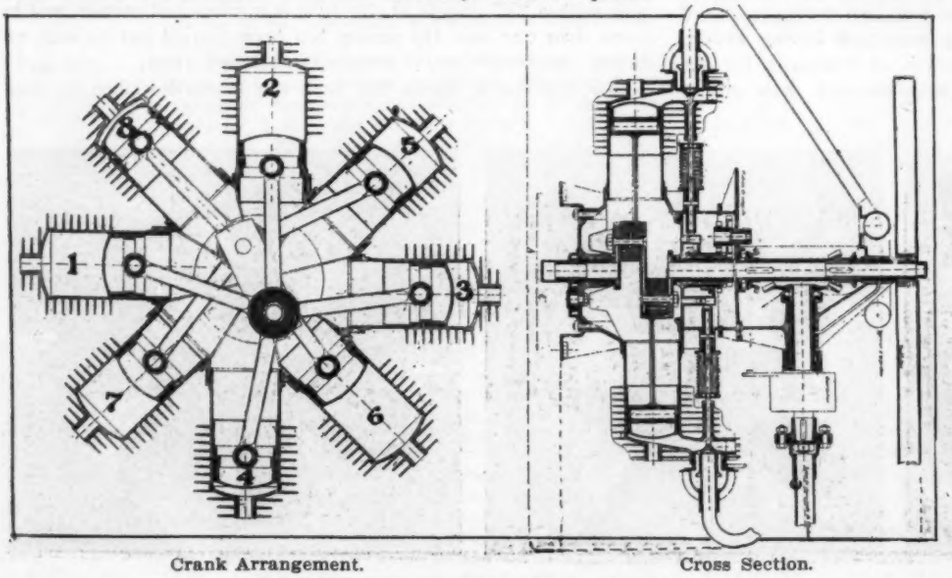
There is little that is standard about the eight-cylinder, sixteen-piston Gobron aeronautical engine which has just been produced. As will be seen from the illustration, the cylinders form an X, and have such an unfamiliar appearance that the newcomer will be puzzled to distinguish between the heads and the base. To understand the motor it should be borne in mind that all Gobron engines have two pistons per cylinder, the heads of which approach one another on the compression stroke and leave one another on the power stroke, the combustion chamber being spaced between the two piston heads. The upper piston is connected to an overhead beam, which in both the car and the aviation motor is common to the pair of cylinders. A long connecting rod links up the overhead beam with the crankshaft, there being, of course, but two of these long connecting rods for a pair of cylinders. The design gives all the advantages of a long-stroke engine without the disadvantage of high lineal speed. The superiority is proved by the fact that for two years Europe refused to admit this type of motor in races against cars with an equal bore.

The designer of the new Gobron has really built a double "V" engine; or, to describe it in other words, two cylinders are mounted vertically on the crankcase; two more are mounted on the under face of the crank-chamber, forming a twin double-opposed engine, and two more are mounted to the left and right of these and at right angles to them, forming either a Maltese



Cam Mechanism. Exhaust. Inlet.

Details of Farcot Combination Valves.

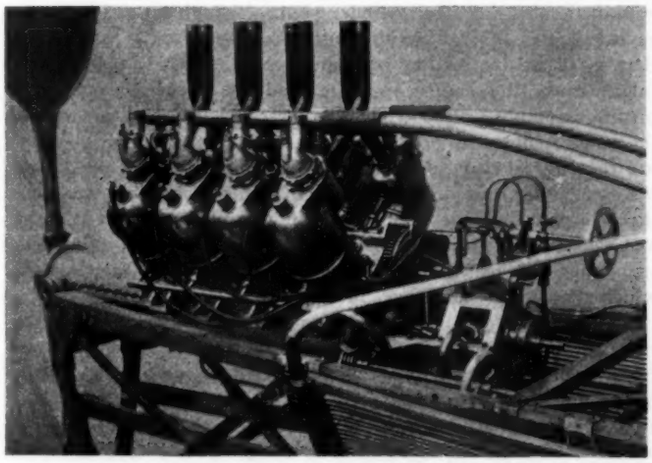


Crank Arrangement. Cross Section.

Air-Cooled Farcot Eight-Cylinder in Detail.

+ or a double "V" according to the way in which the engine is regarded. The sixteen connecting rods are all linked up to a two-throw crankshaft, practically identical with that of the ordinary two-cylinder Gobron. Thus, there is, to begin with, a saving in the weight of the main shaft and an even greater saving in the weight of the crankcase.

The cylinders have a bore of 3 1-2 inches and a total stroke of 6.2 inches, the lower pistons of each set having a slightly longer stroke than the upper ones. The normal engine speed is 1,200 revolutions a minute, at which speed the motor develops 80 horsepower. There is something original in the valve arrangement, the inlets being automatic and placed midway in the combustion chamber, and the exhaust being mechanically operated without the use of any gearing. The inlet is at one side of the cylinder and the exhaust opposite it, the exhausts in one pair of cylinders being operated by a single oscillating beam obtaining its movement from an eccentric working off the crankshaft. The cylinders are a very fine grade of casting and are fitted with copper water jackets. Though nothing has been pared down to a fine degree in the desire to save metal, some very low weights have been obtained. Thus, a complete piston, with its connecting rod and fittings, weighs 11 pounds; the total weight of the

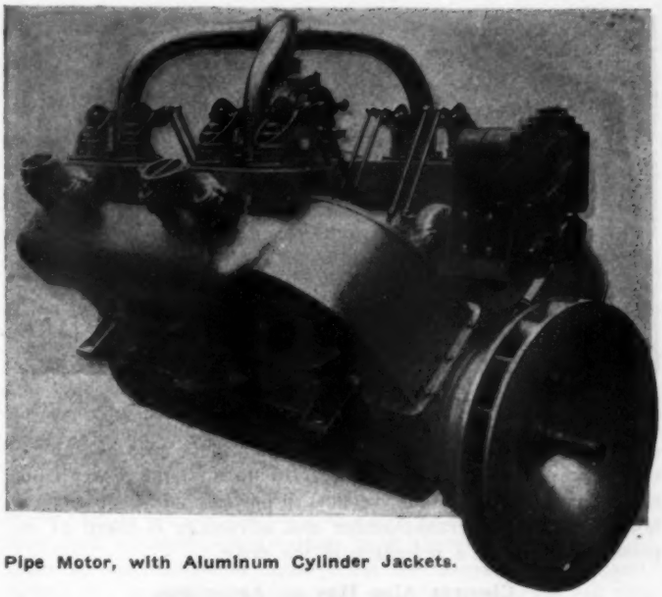


50-Horsepower Antoinette Aeronautical Motor.

crankshaft is 16 pounds. The total weight of the engine, complete with magnetos, carbureter and water, will not exceed 400 pounds, and when properly tuned up will develop 90 horsepower, which is 4 4-10 pounds per horsepower.

Two magnetos are carried on the Gobron, each one being mounted on a platform to the left and right of the crankshaft. It would have been possible to use a single magneto, as is usually done on eight-cylinder engines, but it was preferred to have two in order to have a slower speed of rotation, and in order to give greater security. Each magneto feeds four cylinders in one plane; thus, if one magneto were cut out or broke down, the other would drive the engine as a four-cylinder double opposed. This would give a certain amount of security for aeroplaning, for it would allow the apparatus to be brought back to earth on four cylinders in case of ignition trouble. The magnetos are driven by gearing off the rear extension of the crankshaft, the same gearing being employed for operating the lubricator pump, these two being the entire gears on the engine.

There is less difficulty about the lubrication than might appear at first sight. The oil naturally flows to the heads of the two sets of cylinders, carried head downward, and a pump is employed to carry it up again to the heads of the cylinders that are uppermost, and to the level of the main bearing. An ordinary type of carbureter is employed, without any special branching of the intake piping to reach the four sets of cylinders. It is merely a single length of piping passing successively to each intake. Although the distance that the gas has to travel obviously increases with the length of the piping, it is declared that there is no starving of the cylinders farthest removed from the carbureter. A centrifugal pump, with a capacity of 3-5 of a gallon a minute, takes care of the cooling of the engine.

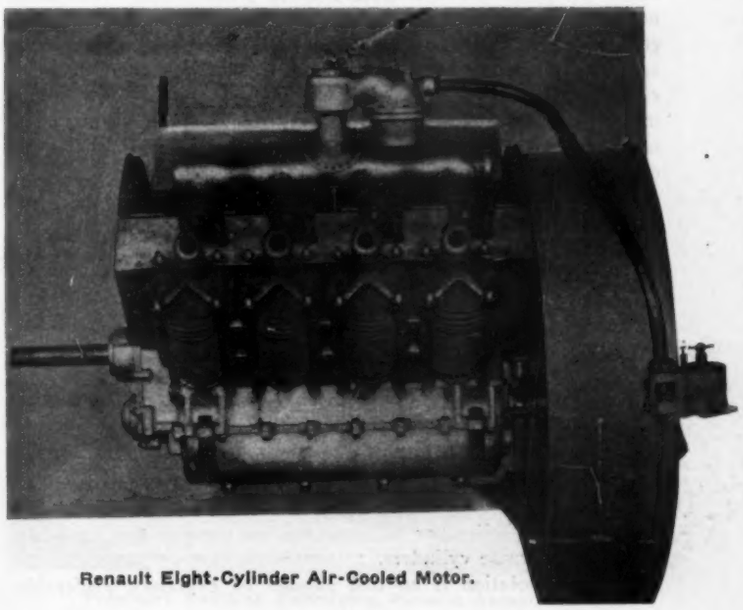


Pipe Motor, with Aluminum Cylinder Jackets.

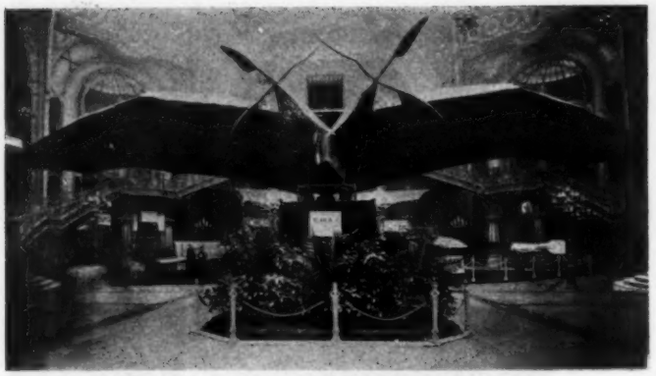
Horizontal Cylinders on Farcot.

One other French aeronautical motor has been produced in which the pistons are connected up to a two-throw crankshaft, without, however, having any other similarity with the Gobron. On the Farcot engine the cylinders are horizontal, and are placed at equal distances around a circular crankcase; they are slightly staggered in order to allow of connecting up to the two pins of the crankshaft set at an angle of 180 deg. to each other. Bore and stroke of the engines is 4 by 4.7 inches, the engine speed being 1,200 revolutions a minute, and the horsepower 50. Cylinders are cast with radiating flanges and receive a current of air from a horizontal fan mounted on the vertical shaft of the engine. A peculiarity of the order of the firing is that the explosions take place first on all four cylinders attached to one pin, then on the four on the opposite pin.

Though carried in outstanding ports, and operated from below, the valves do not follow standard practice, for each one performs the function of an inlet and exhaust, according to whether it is raised by the smaller or the larger of the two cams for each valve. The exhaust is muffled by a perforated cage around each valve, the passing of flame being prevented by the



Renault Eight-Cylinder Air-Cooled Motor.



The Ader Aeroplane that Resembles a Bat.

use of a fine wire gauze screen. Except for use on a helicoptere it is necessary to employ bevel gear to transmit the power from the vertical shaft to the vertical propellers. The gearing is housed within the crankchamber and advantage is taken of its presence to obtain a reduction in the drive.

Clement Also Has an Aeroplane.

Adolphe Clement, the chief proprietor of the Bayard-Clement factory, and one of the most important constructors in France, has already shown his interest in aerial navigation by the construction of a large dirigible balloon equipped with a powerful racing engine, and now about to be supplied with a huge six-cylinder engine developing 200 horsepower. The same factory has also been studying the aeroplane question for the past twelve months and has just produced both an aeroplane of original design and a special lightweight engine of a very interesting nature. It was estimated that 50 horsepower was required for the ordinary type of aeroplane, and it was this power that M. Clerget, one of the company's engineers, sought to obtain with the lowest possible weight. A seven-cylinder engine was decided upon, all cylinders being connected up to the same pin of the crankshaft, the cylinders were to be water cooled, for it was believed that the slight extra weight of cooling water and pump, etc., would be more than regained by increased efficiency, the main shaft to be vertical, with a bevel gear giving a reduction to the horizontal shaft on which the propeller was mounted.

It is only with a large number of cylinders, six or more, that a sufficiently even torque can be obtained to allow of the abolition of the heavy flywheel. Further, it is only by placing the cylinders around a circular crankcase that it is possible to connect them all up to one point and reduce the length of the crankshaft to the minimum necessary for a single throw. But it is not sufficient to multiply the cylinders, putting six, eight, twelve, etc., in one crankcase, for even this will not always give equally spaced explosions. In the diagram are shown two six-cylinder circular engines, in the first of which the explosions take place in the order 1, 2, 3, 4, 5, 6. At first sight it appears to be an ideal arrangement, for while cylinder 1 is firing, cylinder 2 has completed its compression, cylinder 3 has begun its upward stroke, and cylinder 4 has just begun to discharge the spent gases of the previous explosion. But a second revolution of the crankshaft shows that the arrangement is impossible, for when the cylinders come round to the firing point again each one is empty.

Another arrangement suggests itself: firing the cylinders in pairs, the odd cylinders first and the even numbers afterward. As will be seen from the lines uniting the cylinders in Fig. 2, this would give 1, 3, 5, with equally spaced explosions, then an interval before 2 could take up the firing, followed by 4 and 6 equally spaced, and a quick jump to cylinder 1 again. In either case it would be necessary to use a heavy flywheel to overcome the inertia caused by every second revolution being performed without an explosion, or to overcome the unequal spacing when firing on alternate cylinders.

The only solution is an odd number of cylinders, preferably seven, fired alternately in the order 1, 3, 5, 7, 2, 4, 6, when, as will be seen from the lines on Fig. 3, the explosions are always equidistant, thus giving an evenness of running which makes it possible to dispense with a flywheel. The magneto or storage battery supplying the current is naturally called upon to furnish 3 1-2 sparks per revolution, or seven per two revolutions, of the crankshaft. It is this arrangement which has been adopted on the Bayard-Clement, as well as on the Gnome and Esnault-Pelterie, the only other seven-cylinder engines which have proved a success.

Steel cylinders are employed on the Bayard-Clement, the cylinder walls being 2 1-2 millimeters in thickness and tested to a pressure of 132 pounds per square centimeter, in the hydraulic press, without any deformation taking place. The bore is 3.9 inches and stroke 4.4 The cylinder heads, which are dome-shaped to give a hemispheric combustion chamber, are screwed into the cylinder, then brazed. Valves are in the head, the exhaust housing being integral with the head, the valve being fitted through the port for the inlet before this latter is placed in position. The spark plug is placed between the two valves. Copper jackets, brought up as high as possible to allow of cooling the valves, surround each cylinder.

It had been intended at first to use a pressed steel piston in conjunction with a steel cylinder; but, although no defects were revealed after several months on the testing block, it was feared that a slight inattention or failure of the lubricating system might cause the engine to seize, and the rather heavier cast piston was substituted. Cylinders are attached to the base in the usual manner by bolts and nuts, but the method of connecting the rods is quite distinctive. It is impossible to link up all the connecting rods direct to one pin of the crankshaft, and thus there is provided one main connecting rod attached to the pin, and two auxiliary rods attached to the bearing of the main one; two other pistons have secondary connecting rods, each one of which receives an auxiliary, thus making seven in all.

The crankshaft is in two parts, mounted together, and is carried on ball bearings. No flywheel is used, but within the crankcase are very carefully adjusted balance weights to equalize the mass of material attached to the single pin of the crankshaft. Very great pains have been taken to obtain a perfect balance, two months having been spent by the testing department on this portion of the engine only.

All valve-operating mechanism and timing gears are mounted in the upper portion of the crankcase. The single cam, bearing eight raised surfaces, four of them being for the inlet and four for the exhaust, revolves around the crankshaft, in the same direction as it, but eight times slower. Also on the crankshaft extension is mounted the pinion which drives the vertical spindle carrying the commutator. Within the face of the commutator pinion is a bevel gear driving by means of a short horizontal shaft the high-tension magneto, mounted on a platform cast with the crankcase. In the illustration the commutator spindle and gearing are shown, but the bevel gears for the magneto are not in position.

In the base of the crankshaft is the centrifugal pump, also mounted direct on the crankshaft. A peculiarity of this is the use of seven outlets each one of which is connected up by a short length of rubber hose with the water intake of one of the cylinders. The carbureter, a delicate looking little instrument made entirely of aluminum and weighing complete with float chamber and all fittings, just a fraction over one pound, is carried at the base, but on the outside of the crankchamber. Though having more the appearance of a motorcycle than a high-powered engine carbureter, this one has been tested on standard 50-horsepower cars with excellent results before being fitted to the aero engine. Within the crankcase is a gas receiver from which each cylinder takes its supply of explosive mixture. There are four inlet pipes, three of them supplying a pair of cylinders and one linked up direct to a single cylinder.

With the cylinders carried horizontally lubrication resolves itself into the simple task of supplying a regular flow of fresh oil entering the upper portion of the crankcase. In order to find

its own level it necessarily flows over all the main bearings, and from the crankcase lubricates the cylinder walls and wrist pins by splash. There is no reason to fear an excess of lubricating oil, for the exhaust valves being flush with the cylinder walls, and at the lowest point of the cylinder, any excess which may work itself up to the combustion chamber is swept out unburned. During the six months that the engine has been running on the testing block it has been found that every satisfaction could be obtained from drip-feed lubrication.

The motor illustrated is intended for a special type of aeroplane, and is somewhat distinctive in its reducing gear. Ordinarily, however, the transmission is by means of a bevel pinion mounted on the upper extremity of the engine shaft and attacking a horizontal shaft which is machined out of the solid with its bevel gear. Two-thirds reduction is obtained; and it is worth noting that while all French aeronauts were mounting their propellers direct to the mainshaft, the Clement engineers had decided on a reduction which Wright has since shown to be a valuable factor in the driving of aeroplanes.

Gnome and Clement Engines Similar.

In the number of cylinders, their arrangement around a circular crankcase, the method of attachment to a one-throw ball-bearing crankshaft, and the order of firing, there is a similarity between the Bayard-Clement and the Gnome engine. Instead of the explosion driving down the piston, which in turn causes the crankshaft to revolve, on the Gnome engine the shaft is fixed with the result that it is the cylinders which are obliged to revolve around the shaft.

The entire engine is constructed of the highest grade chrome nickel steel, even the cylinders, with their radiating fins, being machined out of a solid bar of steel. Both front and rear faces of the crankcase are separate, being bolted to the deep ring forming the crankcase proper. Instead of being bolted to their base, each cylinder is forced into the crankcase and held there by a split ring fitting into a groove on the portion of the cylinder passing within the case. The engine has a bore of 110 millimeters and stroke of 120 millimeters, hemispheric combustion chambers with valves in the heads, high compression, and delivers 50 horsepower at a speed of 1,200 revolutions a minute.

Pistons are cast, in order to avoid the use of steel against steel, and although all are connected up to the single-throw crankshaft, there is only one main connecting rod. This is machined out of a solid bar of steel, its lower end being a complete broad face ring bored through at intervals around its face to receive the six other connecting rods, which are attached to the main one by gudgeon pins in much the same way as they are secured to the pistons. Each face of the big bearing is deeply recessed to receive a ball bearing, the connecting rod itself not fitting directly onto the crankpin.

The exhaust valve, as already explained, is in the head and is operated by overhead balanced mechanism. The inlets are automatic and are carried in the piston head, the supply of gas being obtained from an ordinary carbureter, carried in any position, with the intake pipe passing along the hollow crankshaft to the interior of the crankchamber. All valve-operating mechanism and timing gears are contained within the forward end of the crankcase; a collar with an external gear is keyed to the crankcase and drives a sleeve free to revolve on the crankshaft. The ring cams are fitted onto this sleeve, being attached by means of a keyway. The cylinders all being in one plane, it has been necessary to slightly stagger the valve guides and tappets in order that they may be opposite their respective valves mounted one behind the other on a single sleeve.

Double Ignition Is Provided.

Double ignition is provided by storage batteries and high-tension magneto, both plugs being carried in the cylinder head. Lubricating oil arrives to the engine by means of a pipe passing through the hollow crankshaft, the distribution of the oil to all bearings being assured by centrifugal force. Without any excessive paring down of shafts, gears and other material it has been possible to reduce the weight of the engine to 165 pounds complete with carbureter and magneto. Long tests on the block have shown also that the engine can be relied on to maintain the 50 horsepower at which it is nominally rated.

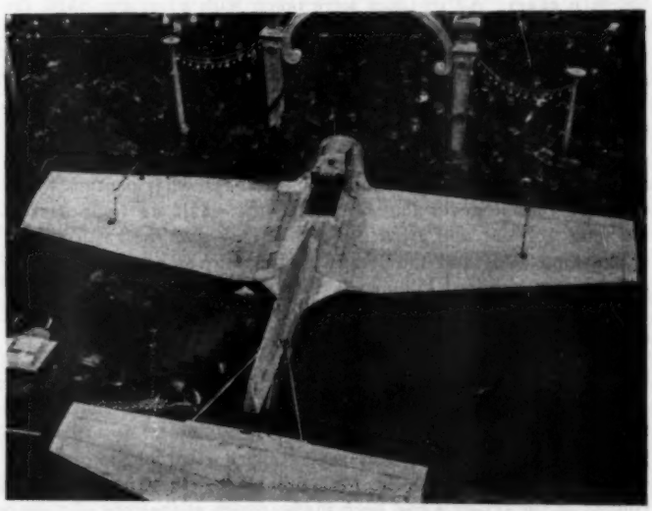
Sixteen Actual Performers Exhibited.

Altogether there were sixteen full-sized aeroplanes exhibited, nearly all of which are machines which have flown or are duplicates of successful machines. In addition to these were a mass of models, doubtless not less than fifty in number, comprising all types of heavier-than-air machines. The point that was necessarily forced upon the visitor was that the aeroplane has already created an industry. The majority of those brought to the show were drawn with the idea of seeing a flying machine and expected to see something freakish that was distinctly in the experimental stage. Instead, they found at least six firms prepared to build machines that will fly, and willing to take payment only when a flight has been made. It is true that at present there are more flying machines than aerial pilots, for there must be at least, in the neighborhood of Paris, three hundred machines fully built or under construction, while those who can fly with them at ease might be counted on the fingers of one hand. Before the second aeronautical show is held, however, all this will be changed.

A number of special motors were shown for aerial work only, the most important of the series being Renault eight-cylinder, air-cooled, Pipe eight-cylinder, air-cooled, E.N.V. and Gordon eight-cylinder, water-cooled, Farcot eight-cylinder, horizontal air-cooled, Rep air-cooled, five and seven-cylinder engines, Antoinette eight and sixteen-cylinder, water-cooled engines, Buchet six-cylinder, air-cooled, and Bayard-Clement seven-cylinder, water-cooled horizontal engine.

I. A. A. CALLS FOR LARGE PRIZE FUND.

LONDON, Jan. 12.—At the meeting of the International Association of Aeronauts here to-day a resolution was presented by President Jacobs, of the Aero Club of Belgium, to the effect that the association should offer prizes to the amount of $240,000 for aeroplanes and dirigible balloons. This amount is to be divided into a number of prizes, providing for a $10,000 gold cup as a special prize for flying machines, and ten prizes of $20,000 each, half of which shall be for dirigible balloons and half for flying machines, besides a $10,000 cup in each department. It is proposed that these ten prizes shall be competed for in ten separate competitions, one to be held every five years. To raise this fund, it is suggested that the United States, Great Britain, Germany and France each contribute $40,000, and Belgium, Spain, Italy and Austria $20,000 each. Of the total, the sum of $20,000 is to be devoted to the construction of portable sheds to house the competing machines.



President Fallières Examining Peiterie Aeroplane.

HOW WILBUR WRIGHT WON THE MICHELIN PRIZE

LE MANS, France, Jan. 1.—The Michelin prize is won, and when Wilbur and Orville Wright sail for America next March they will have in their possession the work of art donated by the French tire king and $4,000 in cash from the same source. It was on the last day of the year that the attempt was made and a new world's flying record put up with 2 hours 18 minutes 33 3-5 seconds, official distance covered 77 miles 760 yards; actual distance about 95 miles.

Early on the morning of December 31 the machine was brought out of its wooden shed to the now dreary plain with its background of fir trees hidden under a thick layer of snow. It was cold, but not so cold as two days before, when Wright had tried to put up a new record and had to give in after 1 hour 52 minutes 40 seconds in the biting air. Some changes had been made to fit the machine for its aerial voyage; an additional gasoline tank had been added; the supply of oil had been increased; the two propeller shafts had been united by a transverse chain in order to keep both propellers running if one of the driving chains broke; finally the machine had been carefully examined to see that all was in good order.

At 11 o'clock a start was made, but after 45 minutes in the air it was discovered that the cock of the new gasoline tank was leaking badly, and a return had to made to earth. An adjournment was made for lunch. In the meantime, Minister of Public Works Barthou, who had traveled down specially from Paris, arrived on the scene and closely examined the homely-looking but wonderful flyer.

Beginning of the Record-Breaking Flight.

Exactly at 2 o'clock the machine was on its rail again; Wilbur Wright, closely enveloped to protect him against the cold, was on the outside seat, the catch was released, the aeroplane jumped ahead, and in a fraction of a second was in the air making for the triangular course marked out according to the rules of the Michelin competition. The triangle was one having two sides measuring 1,093.6 yards and the third side of 218.7 yards, giving a total distance round of 2,405.9 yards. Each of the angles was marked by a flag, and at each turning point a committeeman was stationed to see that the machine kept fully to the outside.

In a second the white bird had reached the first flagpole, and with that peculiar sliding motion that is one of its characteristics, had slipped round with a considerable heel, and was again on an even keel. A straight run of over one thousand yards, then another sharp turn, another straightaway of the same length, then a turn and the short leg of the triangle was entered upon. The aeroplane, indeed, had hardly straightened out before it was in the turn again. All of them were taken with admirable skill, the machine naturally losing ground at each turn, but nevertheless swinging round in a manner that no other aeronaut has been able to imitate.

After a quarter of an hour it became monotonous, for these triangles in the air were performed with so much regularity that one ceased to wonder, and it needed an effort to recall that this man was doing with the utmost naturalness what centuries had dreamed of but never dared to hope for. Half an hour passed, an hour, an hour and a half, and still there was the rattle of the exhaust up aloft and the steady gliding movement of the aeroplane. One hundred kilometers were covered, and the time was noted: 1 hour 52 minutes 15 seconds. Two hours passed and the light began to grow dim, but still he flew on.

"Sunset!" Concluded the Great Triumph.

"Sunset," yelled the timekeeper at 19 minutes past four. Still the artificial bird flew on. But not for long; a few hundred yards more and the engine was stopped, the machine settled down to the earth, and the Michelin prize was won. Fifty-six rounds of the triangle had been made, which at the rate of 2,405.9 yards per round, gave a distance of 76 1-2 miles. To this had to be added 1,203 yards covered after the last passage of the counting point, and the initial 437 yards from the end of the starting rail to the commencement of the triangle, making a total of 77 miles, 760 yards. Making a reasonable allowance for the space lost in three turns per round, and an actual distance of about 95 miles is obtained—the longest flight ever made by any aerial machine of the heavier-than-air type.

Minister of Public Works Barthou rushed forward, and was the first to congratulate the American aeronaut on his splendid performance and the winning of the greatest prize of the year. But there was other work to be done, and hurriedly the apparatus was mounted on the rails, the weights hoisted, the Frenchman invited to take a seat beside the pilot, and they were off in the semi-darkness. The preparations had been too hurried, however, for no sooner had the end of the rail been reached than the big apparatus dropped to the ground. Again it was mounted, again the weights were hoisted, an extra one being added to give a quicker start, and at 5.20 P. M., in complete darkness, the aeroplane and its two passengers rushed off into space. There were a score of automobiles on the edge of the ground, all with their headlights lit, and it was under their glare that the last flight of the old year was made. It only lasted four minutes, but it was evidently enough for the Minister, for on descending he felicited the American pilot more heartily than before.

"It is superhuman how you can remain on the machine for over two hours. I was only up for four minutes and already I am almost frozen. And what a sense of security there is; absolute security."

"Yes," replied Wilbur Wright. "You are safer on my aeroplane than on your railroads."

The health and continued success of the aeronaut were drunk at a gathering at the Aero Club immediately after the afternoon's performance. Minister Barthou was elected an honorary member of the Aero Club of the Sarthe, and, all over, the officials took the train for Paris, while Wilbur Wright made his way to the plain wooden shed on the wild plane, and slept on the rafters with his invention and companion below him.

Both Henry Farman and Moore Brabazon had entered for the Michelin prize on the last day of the year, but neither was able to do anything worth recording. Farman, on the plains near Chalons, flew 1,000 to 1,500 yards on several occasions during the afternoon, but his motor was not properly tuned up and was unable to run steadily for more than a few minutes at a time. Moore Brabazon, on the same ground, endeavored to get into the air, but without success. Finally the attempt was brought to an end by the explosion of the gasoline tank.

Conditions Will Be More Severe for 1909.

In a few days the conditions will be announced for the 1909 Michelin prize, the regulations for which must be drawn up by the Aero Club of France. The conditions for the first year were that the distance should not be less than 20 kilometers, and that the test should be made round a closed circuit in order to facilitate the control. With almost 100 miles having been covered the first year, it looks as if the regulations would have to be entirely modified for the next cup. Although Wright stopped after about two and a half hours aloft, he could have continued for five hours if he had wished to fly until using the last drop of fuel.

The Paris to Clermont-Ferrand trip, which a year ago appeared a chimera, is now thoroughly practical. Had Wright started in a straight line from Paris instead of turning over a drill ground, his record distance would have taken him to Chalons, where his rival Henry Farman was vainly endeavoring to get into the air. Had he gone south, he would have covered half the distance to Clermont-Ferrand. It would not be at all extraordinary, therefore, if next year an attempt were to be made to win the $20,000 for uniting Paris with the Auvergne city 230 miles away.

FOR AMERICAN MAKERS SEEKING FOREIGN MARKETS

By RENE PETARD.

THE present writing has for object to take avail of the activity created by the "show period" to point out the possibilities of the export business to American manufacturers and to review a few considerations to be kept in mind in its creation.

Although America, generally speaking, is one of the world's foremost exporters, its position as an exporter of automobiles is far from being in keeping with its rank of largest producer of these. Complete figures for the year just passed are not yet available; it, however, is easy to surmise that, except as regards trade with other American nations, the 1908 figures will not show over the preceding ones an advance commensurate with the magnitude of the industry. At the close of 1907 the capital invested in the automobile trade was given by the Department of Commerce and Labor as $188,400.00. This investment only resulted in exports outside the American continent amounting to $3,415,459. The enormous discrepancy between these two figures emphasizes the need for action on the part of American makers if they want eventually to avail themselves of all the benefits to be accrued from a prosperous foreign trade.

A few firms which could be counted on less than the fingers of one hand have recognized the inconvenience of this situation. Their efforts, however, were not always equally successful, due in part to lack of sufficient knowledge of the requirements of the markets to be exploited or to the absence of a proper organization. It should also be remembered that the production of such a large country as the United States necessarily is of the most varied order, and that among all the vehicles made it is impossible for every one to be equally suited to the requirements of every market in the world.

The value of the export business is obvious. Besides being a direct source of profits, it is an insurance against over-production, and if properly handled supplies an almost unlimited market (not a dumping ground) for the output which in dull times may exceed the home demand. At any rate, by increasing the quantity of product turned out it cheapens production, a point by no means small in these days of keen competition.

Many makers apparently consider that the remarkably prosperous outlook for 1909 in home sales precludes the necessity of outside efforts for the time being. If it is looked back to the bicycle days, which taught so many lessons to the export trade, it will be at once impressively seen that prosperous days essentially are those during which an outlet must be prepared for the days when the home demand will decrease. Foreign markets will only be ready in dull times in proportion to the work previously expended on them, and the early comers will get the lion's share.

In most centers the situation is highly favorable to the American maker, who, with the trend of improvement, has learned how to produce satisfactory vehicles at a lower price than the foreigner. Nevertheless, a handicap has been created in certain countries by the shipment of machines which, through some defect in workmanship or material, would have been unfit for the home trade. In fact, there now are makes on the American market which have been so widely and so unfavorably advertised abroad in this respect that any amount of expense to reintroduce them would be a dead loss. It is by making it a point to only send out goods rather better than what they supplied to home consumption that English merchants have held their leading rank in the general international trade of the world, and their policy should be universally followed as the only one productive of good results.

To offset the prejudice caused in certain quarters, the American maker will have to supply his product through an active organization prepared to do the missionary work required to restore confidence. Once this result obtained, and it will be easy for a really good machine. The amount of business which will be possible can hardly be realized by one not posted on the buying.

The need for a special organization is further increased by the fact that sales in most markets cannot be made direct from America. The flow of auotmobile buying goes to Europe and mostly to Paris, which accounts for the recent installation of distributing branches in that city by several prominent English and German houses.

One of the great mistakes of American makers in all lines of export has been the useless mailing of never-read printed matter in the English language. If printed matter is at all sent it should always be written in a language commonly understood in the countries where it is sent; French or German will generally better cover continental Europe than would English. In preparing these catalogues close adherence to the American text is not desirable; account has to be taken of the people's habits and ideas, and, often, claims which will very forcibly appeal to the American public will have an entirely opposite effect on the foreign. One instance came to the writer's notice lately in France. The catalogue of a new and remarkable American car was being shown to parties in the trade and independent; in all cases was most favorable comment attracted by the machine, but in all cases also was a part of the catalogue most useful to the American buyer condemned; it was a relation of the foreign machines embodying the same features of design as the machine considered. This was an example of a thing perfect for America, working to an entirely opposed end in another country. Writing a proper catalogue for export can only be done by a man having had actual experience in the lands for which it is intended.

Better than printed matter are traveling salesmen. Sending them from America would be prohibitive, on account of cost, but from a foreign branch they could be sent at a much less expense, both as to salary and traveling cost. The importance of proper representatives in far-away countries is still greater than in the home trade, and incompetent men were often the source of considerable loss in both money and opportunities.

In replying to foreign inquiries, the American maker often boasts of enormous factory outputs. It is right to say that these are in most cases justified, but, however great may the opinion of foreigners be of the activity of this country, they generally lack a basis of comparison to actually realize it, with the result that the inquirer thinks that he is imposed upon, or else, not being educated to the possibilities of quantity production, he concludes that the product made in such large quantities can only be poorly made and badly conditioned. The writer often confronted very deeply rooted opinions to that effect.

In some cases the opportunities for a good trade have been utterly spoiled by the pretensions of some exclusive agent abnormally swelling the prices to increase his profit. This is especially frequent in the Orient. It, then, is well for the manufacturer to provide a fair limit in the selling price, and if necessary to advertise it to a certain extent.

The amount of loyalism to one make which proper treatment can develop in certain buyers is remarkable, and this is very cleverly exploited by German manufacturers, from whom it generally is very difficult to take a customer. This could be turned to advantage by the American manufacturer if he came first to take possession of a trade, distancing his less enterprising competitors.

One feature which greatly hurt the American bicycle export trade was that of the spare parts. If a successful and lasting automobile trade is to be built up it will be necessary to establish at least one depot in the central selling branch. This will be found of considerable assistance in sales.

Advertising in foreign magazines and trade papers outside of the English is of very little use, for, although it is very cheap, it is still too expensive, the Anglo-Saxon being the only European who reads advertisements.

BAY STATE'S GOVERNOR ON ROADS AND AUTO LAWS

BOSTON, Jan. 11.—In his inaugural address Governor Draper devotes much attention to the question of improved State highways and the regulation of automobile traffic. The Governor cites the maintenance of the roads as a serious problem and says that last year it cost $295,000. Referring to the use of the State roads by automobiles, Governor Draper says:

"I believe that their number will increase, and, while this may be a good thing in many directions, they certainly make it much harder to keep the roads in condition, and therefore the annual amount to be expended for keeping the roads good must be materially increased. The Highway Commission estimates that it will require at least $300 per mile per year to maintain the State highways in proper repair. There can be no doubt of the wisdom of maintaining in good condition the splendid property which we have, rather than increasing our mileage rapidly by borrowing money for new construction and allowing the roads to run down because of insufficient expenditures."

Discussing automobile traffic, the Governor says:

"It seems to me obvious that a change ought to be made in the registration fee for automobiles, and that a graded fee should be established, by means of which the people using machines which destroy the roads would be compelled to pay to the commonwealth a proper amount for repairs. I therefore believe and urge that legislation should be enacted which would require the owners of high-powered, heavy and fast running automobiles to pay a greater license fee than is charged to citizens owning lighter and less destructive motor vehicles. Such laws have been enacted in other States, and, in my opinion, are practical and comparatively easy of application. I think, further, that the money raised from such registration fees should be used for the maintenance of State roads."

The Governor favors the construction of State roads so as to connect with the main roads of adjoining States, forming trunk lines. He says that the laws should be amended so as better to regulate the conditions under which automobiles are run, the object to be attained being the prevention of reckless operation. "Speed limits," he says, "may have their advantages, but they oftentimes work a hardship on careful operators. The laws should be so framed that any reckless operation of a motor vehicle, at any speed, should be the test for fine or other punishment, as the case may be. The object to be attained is to frame laws which will prevent reckless and dangerous operation of such vehicles. Where any particular person is convicted, the penalty should be severe; and if glaring cases of recklessness are found, the guilty operator should be prohibited from further opportunity for such action. I would further suggest that some law might be passed which would make it a criminal offense to use an automobile without the owner's permission."

CONNECTICUT'S LAW NOT OUT OF DANGER

HARTFORD, Conn., Jan. 11.—Now that the Connecticut Legislature is about ready to get down to business, autoists in the State are anxiously watching out to see what is going to happen to the present law. One bright lawyer, a member of the Legislature, is credited with being the author of a fool measure to limit the power capability of all gas cars.

The Connecticut Automobile Asociation and the Automobile Club of Hartford will always be represented at the Capitol, not so much as a precautionary measure, but rather that desirable assistance be rendered. It is the consensus of opinion among the legal talent that the present law is adequate, but it should be more strictly enforced. A fixed speed limit is undesirable for many reasons, and to express the matter as set forth by a well-known member of the bar: "A fixed speed limit invites the best of us to violate the law upon opportunity."

Unfortunately, during the past six months there have been several fatal accidents, two of which have happened in this city. For each offense the guilty parties were and are now serving sentence. It is the opinion of one faction that once the adequacy of the present law is made tangible to the Legislature, that its perpetuation will no longer be a matter of question. There are at least a good many supporters of the present law in the Legislature, and of the State officials there is no more hearty supporter than Highway Commissioner MacDonald.

MARYLAND MAY HAVE NEW LAW AND BETTER ROADS

BALTIMORE, Jan. 11.—A bill drafted by Col. Sherlock Swann, of the State Automobile Commission, has been approved by that commission and will be introduced in the next Legislature. The bill will revolutionize the status and standing of automobiles in this State, and will give Maryland, so the commission thinks, one of the best auto laws in the country. The bill is made up of the best features of the laws of twenty other States and also contains many of Col. Swann's ideas. The bill as approved by the commission provides for the annual license of automobiles according to horsepower. At present a license tax of $3 is paid by the owner of an automobile, and that license is good as long as the automobile lasts.

The new law will provide for an annual tax of from $6 to $24, according to the horsepower of the car. These licenses will have to be renewed this year. The bill further provides for the appointment of a special State official to take charge of the automobile law and its execution. A liberal speed limit is to be allowed, and is to be arranged according to cities, towns, suburbs and upon crowded thoroughfares. Streets or roads are divided into three sections—cities, thickly settled and sparsely settled. Speed will be regulated for each of these sections. Heavy penalties are provided for violations of the speed limit. In addition to fines and imprisonment, the licenses may be revoked. The idea is to turn the revenues from the annual licenses, with all automobile fines, over to the Good Roads Commission, and will be expended in repairing and constructing good roads.

Governor Crothers says that these licenses and fines will produce for the State a revenue of from $75,000 to $100,000 annually, and that in ten years this revenue will reach $400,000, basing this calculation upon the rapid rate at which autos are increasing.

Governor Crothers has announced that he favors a second bond issue of $6,000,000 for improved roads in this State, with $2,000,000 of the amount to be used in improving the streets of Baltimore. The Governor figures that this loan, as well as the $5,000,000 granted by the last General Assembly, will not cost the people a cent more of direct taxes. He figures that the proposed increase in automobile taxes and other taxes special taxes will pay for the interest on these bonds.

The Automobile Club of Maryland, through President H. M. Rowe, has announced that it favors the new bill.

AUTOMOBILE ENGINEERS TO HAVE SESSION DURING SHOW

ALTHOUGH a surprisingly large number of the engineers of firms who will only exhibit at Madison Square Garden attended the first session of the fourth annual meeting of the Society of Automobile Engineers, which was held at the Automobile Club of America last Tuesday, the plan of the meeting as originally determined upon last October was to hold a one-day session during the course of each of the shows in New York. The second session will accordingly be held Tuesday, January 19, or on the third day of the show at the Garden. As was the case at the opening session, members will convene at the Automobile Club of America at 10 A. M., where a series of tests of the club's recording dynamometer will be run off by Henry Souther, a member of the society and the chairman of the technical committee of the club. After explaining the workings of the apparatus and the various recording instruments, Mr. Souther will try to run a regular series of tests on the dynamometer, following which the members will adjourn for a discussion of the records thus made. Luncheon will be served at the Automobile Club.

The members will then adjourn to the Engineering Societies Building, in West Thirty-ninth street, near Fifth Avenue, where the technical sessions will be held during the afternoon, convening promptly at 2 P. M. The papers to be read are: "The Economics of Weight Reduction," by F. D. Howe; "An Improved Type of Compression Coupling," by W. S. Noyes; "Standardizing Motor Bearings," by S. P. Wetherill, Jr.; "Some Practical Considerations in Autogenous Welding," by Henry Cave, the author giving a demonstration of the various operations of welding and cutting by means of the oxyacetylene flame, in connection with the presentation of his paper, and "An Indicator with Continuously Rotating Drum," by S. W. Rushmore and H. L. Towle. A general discussion of the points brought out by the author will take place after the reading of each one of the papers.

As autogenous welding, which has already been developed to a considerable extent abroad, is destined to occupy a very important place in automobile construction in the future, and has already made itself invaluable for general automobile repair work, the demonstration to be given by Mr. Cave will be of unusual interest.

Mr. Howe's paper on the "Economics of Weight Reduction" embodies a suggestion that comes as a matter of interest to automobile user and manufacturer alike, and not in the lesser degree to the former by any means. The time has come when the average owner of a car has become tired of transporting useless weight, which simply means that he is burning that much more fuel and oil and wearing out tires that much faster because he has to carry it, and he is going to show the manufacturer sooner or later that it will pay to reduce weights even further than the use of costly materials has already brought them. The improved type of coupling referred to in the paper by W. S. Noyes is known as the Imperial compression coupling, and while it forms a very small part of the construction of an automobile, relatively speaking, the importance of having a coupling that cannot only be depended upon to hold, but that can be taken down readily, is frequently paramount.

The expense of manufacturing the motor would be greatly reduced and the cost of bearing replacements likewise brought down, where the user is concerned, if the practice of using a standard type of bearing for this essential of the car were to be adopted, as advocated by S. P. Wetherill, Jr., in his paper. Motor dimensions have already reached a point where they may be said to closely approach standards in many respects, and in none more than in that of bearings, the differences frequently being very small indeed. One of the most interesting papers to be presented at the meeting is that by S. W. Rushmore and H. L. Towle, on "An Indicator with a Continuously Rotating Drum." The usual method of testing engines has never been entirely satisfactory where the automobile motor was concerned, and while the manograph has represented an important step in this direction, still it is not all that can be desired. Some means of learning what is going on in the motor while it is actually in service on the car, and not merely mounted on a block under test conditions, has always been wanted. Mr. Rushmore has invented an indicator for this purpose, and a large number of its records are shown in connection with the paper, some of them having been taken at speeds ranging from 40 to 50 miles an hour.

Following the reading of the papers and the subsequent discussion, the members will adjourn to the Engineers' Club in West Fortieth street, where the annual dinner of the society is to be held. Visiting automobile engineers who are not members of the society are invited to attend the session. They will be welcomed, and it is hoped they will find the session of interest.

PENNSYLVANIA'S TRANS-STATE HIGHWAY HOPES ARE HIGH

PHILADELPHIA, Jan. 11.—Automobilists here are delighted over the strong indorsement of the trans-State highway given by Governor Stuart in his message to the Legislature at its convening last week. After showing that the Highway Department, since its creation in 1903, had completed 542 miles of roads, with 223 miles under contract—and incidentally strongly disapproving of the present piecemeal system through which "much of the money expended by the State for road improvement will be wasted"—the Governor urged the necessity of a "State system of main highways connecting the several county seats; the county should construct roads connecting important points in the country, and the township system of byroads, leading to the main ones, should be constructed by the township, or by the township and county jointly."

As a beginning of such a system as he outlines, the Governor recommends "the building and maintenance, entirely by the State, of a road to extend from the seaboard to the Ohio valley, between the cities of Philadelphia and Pittsburg, via Harrisburg, the capital. This highway should be in the interest of the greatest number. The route is sufficiently precise as to location to be a decisive and fair plan. The line may be subject to local changes, without avoiding the cardinal objective points. Thus populous centers will be traversed, and important cities and county seats will be connected, representing a county population of more than 50 per cent. of the entire population of the commonwealth. No other line for a main road can be found which would reach so large a proportion of the State's population, or which would serve so many useful purposes. I recommend that the determination of the exact route be placed in the hands of the Highway Commissioner, Attorney-General and Governor."

The advocates of the Juniata Valley route are taking much comfort from the Governor's inclusion of Harrisburg, the State capital, as one of the "cardinal objective points" on the route. If the capital is included it will be much easier, they claim, to continue on through Juniata Valley, via Mifflintown, Lewistown, Huntingdon and Tyrone to Altoona, than to make a long detour to the southwest in order to reach the old post road at Gettysburg or Chambersburg. They also point out that that portion of the Governor's screed which says that "important cities and county-seats will be connected, representing a county population of more than 50 per cent. of the entire population of the commonwealth" cannot possibly refer to the southern route, for not only are there fewer county-seat towns on that route, but the towns, with but few exceptions, are smaller. Besides, by including Harrisburg as one of the "cardinal objective points," the route to the capital via Reading can be selected.

LETTERS INTERESTING AND INSTRUCTIVE

CONSIDERING DIFFERENT BEARINGS.

Editor THE AUTOMOBILE:

[1701.]—I notice that on some of the "big cars" the hubs of the road wheels are quite small, and with some of the runabout types the reverse is true. Does not this indicate a lack of uniformity, or, worse, is it not a fact that some of the cars are without adequate bearings in the road wheels? HARMONY.

New York City.

It is well to observe, it is even better to think, but is best to think twice. The weight of a car does not serve as the sole criterion in determining as to the proper sizes of bearings to use in the wheel hubs. The weight of a car does serve to fix upon the static responsibility. In a kinetic sense the question is one involving the speed of the car, on the one hand, and the ability of the tires, on the other. For a given speed, the car with the largest pneumatic tires is the car that will allow of the use of the smallest bearings, in point of actual ability. Considering the same (given) speed, it is even permissible to use smaller bearings on a big car, so called (if large tires are used) than might be used on a runabout, with smaller sized tires. It is the shock that is to be feared, and it is the large tires that abort shock. By large tires is meant tires large in proportion to the load. Then there is the relative value of the several types of bearings to be considered. For a given rating, all the bearings do not occupy the same amount of space. This in itself will make a difference in the external appearance. Finally, there is no better illustration of the point to be made than to repeat the statements of Henry Hess in relation to the effect of different tires on the sizes of bearings to use, referring specifically to "H-B" bearings. The relations were put as follows:

(a) With pneumatic tires..... 100
(b) With solid tires..... 75
(c) With steel tires..... 60

In other words, it is to say the ball bearings that would do for a case involving pneumatic tires, under suitably regulated conditions, would be 25 per cent. below the requirements with solid rubber tires and 40 per cent. short in the cases in which steel tires are considered. In this statement no account is taken of what would be the case were it possible to maintain the same speed with the several tires. As a matter of fact, the speed would be lower for the solid tires than would be the allowable speed with the pneumatic tires, and, again, the speed with the steel tires would be still lower.

NOTHING THAT SHOULD GO IN AN AUTOMOBILE.

Editor THE AUTOMOBILE:

[1702.]—Please decide a dispute in your "Letters Interesting and Instructive" regarding a brake system, which I have designed, by stating whether or not the 4-inch levers of the equalizer are to be considered as intermediaries and therefore do not either increase or decrease the pull of 96 pounds from each wheel on the 6-inch bellcrank lever. Also kindly state the pressure on the in-pounds required on the foot pedal. MISSOURI.

The pull of 90 pounds exerted on the brakerod and transmitted to the equalizer bar will still be 90 pounds, if it is true that two 4-inch levers are placed 180 degrees apart on the shaft. There would be no difference in time or pressure at the end of two levers so placed. No amount of pressure on the foot pedal would give you any result at all, because the mechanical motions do not seem to be true. The lever on the pedal shaft will rotate away from the bellcrank on the second shaft, and you do not show a means of taking care of the difference.

Your drawing does not express your idea clear as it should be expressed, in order to have it understood by others, and it is possible that you do not contemplate the use of a lever system such as this. At all events, it does seem as if the scheme is half baked and far too crude to be discussed as a brake system in work of the character involving automobiles.

TWISTING MOMENT IN LIVE REAR AXLES.

Editor THE AUTOMOBILE:

[1703.]—Every time I take off the hub cap of my car I am impressed with the smallness of the "jack-shaft," if such it may be called, and the largeness of the load. Instead of worrying about it for a year and a day, it is my purpose to have you tell me if the present practice is safe; if, in fine, a 1 1-4-inch shaft is suitable for the purpose. My car weighs about 3,000 pounds, will do about 45 miles per hour, and I would think about 60 per cent. of the load is on the rear axle. The wheels are fitted with 36-inch tires. Of the material in the jackshaft, I know little or nothing; the power, on the whole, it is very satisfactory, and this should indicate the use of fair material in the shaft. P. B. P.

Ogdensburg, N. Y.

Let,

d = diameter of the shaft in inches;
R = radius of the road wheel in inches;
f = coefficient of friction between tire and roadbed;
w = weight in pounds on one wheel;
S = allowable extreme fiber strain in the material;

when,

$$d = \left\{ \frac{R\,f\,w}{S} \right\} \frac{1}{3}$$

For the case in point it is to say,

$$d = \left\{ \frac{18 \times 0.60 \times 900}{16{,}000} \right\} \frac{1}{3}$$

= 7-8 inch, nearly; taking the next above fraction of convenience.

This is on a basis of 16,000 pounds per square inch of fiber strain, which is not excessive, considering good steel. As will be seen, then, the shaft is not too small, from the torsional point of view.

You failed to give information in relation to the bending moments. In other words, if the shaft overhangs the bearings the result will be by way of bending moments that will have to be taken into account ere it will be possible to say to what extent a factor of safety resides in the shaft in question. It is not uncommon to find an overhang of 2 inches, and on this basis it will be possible to ascertain what the effect will be; proceeding as follows,

Twisting moment in inch pounds = $18 \times 0.60 \times 900 = 9{,}720$;

Bending moment in inch pounds = $2 \times 900 = 1{,}800$;

combining,

$$1{,}800 + (1{,}800^2 + 9{,}700^2)^{\frac{1}{2}} = 11{,}666, \text{ nearly};$$

and,

$$D = \left\{ \frac{11{,}666}{16{,}000} \right\} \frac{1}{3}$$

= 15-16 inch, approximately; taking the next up 1-16 inch as a desirable figure;

in which,

D = the diameter of the required shaft, on a basis of bending and torsional moments combined.

The required size of the shaft is still less than the size actually used in the car. The reason for this lies in the fact that "keying" reduces the strength of the shaft and, as a result, must be taken into account. Since the depth of the key is no more than the difference, it is reasonable to assume that the diameter of the shaft was made as much more than the size as dictated by theory, as is represented by the depth of the key in the shaft. This investigation is a little at odds, due to lack of data. The overhang may not be quite 2 inches; the weight may not be exactly as assumed; the shaft may be alloy steel, in which event the fiber strain taken is low; in fine, it is necessary in practice to consider all the influences.

In any case it will be well to guard against too much accuracy in a situation such as this, on the ground that the material to use must depend upon experience rather than some preconceived notion of the mission that "jewelry steel" may have to perform

in this world of much uncertainty. If experience in your case is such as to lend confidence, you will be justified in accepting the figures as above given, rather with the hope that they reflect the state of the case with fair accuracy. On the other hand, it is right to say the designer of the car, at the time of designing the jack-shaft, had far more chance of fixing upon suitable dimensions of the shaft than can one, at a distance, in the absence of exact data.

WHAT TO DO WITH A WHITE ELEPHANT.

Editor THE AUTOMOBILE:

[1704.]—I have a single-cylinder car of a well-known make, four years old. I have lengthened out wheelbase, made body side entrance, and practically everything is up to date but the power, this being the only next thing human nature rebels against now. Getting a new car and trading this one is out of the question—first, because one gets nothing for the old one, and, second, because I can't afford it. How would it do to put on, say, half-inch bigger bore cylinder? The present one is 5 by 5 inches. Would you advise using the same size intake and exhaust valves and carbureter? How much more power in your estimation would I gain by such a move? HARRY J. SWOLE.

Ansonia, Conn.

The only best way to increase the effectiveness of your motor lies in the direction of the alteration of the gear ratio in favor of the motor. The next best scheme is to use a flywheel of greater effectiveness; in addition to these expedients, you can very well afford to see to the carbureter, improve the ignition and look out for the compression. Nothing is to be gained by altering the sizes of the valves if they are of a fair size now. The fact that they may or may not be of the same size is of small concern.

THE VENTURI PRINCIPLE IN CARBURETERS.

Editor THE AUTOMOBILE:

[1705.]—The Venturi tube must have some especial value in carbureters because it is used; that is to say, the principle, in quite a number of them, and it is not far from right to say that it is in "good" carbureters that the method is exploited. Without going into mathematical detail, will you please state the real reason why the shape conforming to the Venturi principle is of value in this class of work? 1-80,000,000.

New York City.

The "Venturi" tube will be approximated if two hollow truncated cones are brought into such relation that the small ends will meet. When this principle is properly incorporated into a carbureter the suction pressure on the gasoline through the nozzle is constant, or more nearly so than will be possible in any other way as yet tried out, in so far as is generally known. Considering the Venturi tube, there is a point in the progress of the suction when the pressure ceases to increase, and as a result the flow of gasoline is in proportion to the requirements rather than in excess at high speeds.

WOULD MAKE A TWO-PLY CRANK OUT OF YOU.

Editor THE AUTOMOBILE:

[1706.]—What would be the effect if a spray of water was forced into a gas engine cylinder before the explosion or combustion of the gas? A CRANK.

Buffalo, N. Y.

Water in the cylinder would upset the mixture, which is never so good as to stand the change and leave the motor in a state fit to talk about. It is a fact, however, that the right amount of water under well regulated conditions would "tend" to fatten the curve of expansion, and theorists dream about it. On the other hand, when the "octopus" delivers gasoline with even a little water in it, the water is not carefully separated out, trouble is spelled with a capital T.

WANTS REPAIR PARTS FOR THE DRAGON CAR.

Editor THE AUTOMOBILE:

[1707.]—I have written several letters to the Dragon Automobile Company, at Philadelphia, but have failed to receive any reply from them, neither have my letters returned. Do you know if any one is to continue the manufacture of the Dragon cars? Can you tell me where to secure repairs for the different parts of this car, such as the engine, transmission, rear axle, etc.? I would like to secure some repairs for this machine when I overhaul it this Winter. My car has run 12,000 miles, with absolutely no repairs, no adjustment ever taken up on the engine, and no trouble except tire troubles. It is certainly the best car for the money I ever saw. And it is a pity that the company does not continue to build them.

Lafayette, O. H. P. M.

It is understood that the manufacture of this car has been discontinued. However, if you will write to Yardsley, Levene & Co., Philadelphia, you can doubtless obtain a supply of repair parts such as you desire.

ABOUT THE RESILVERING OF LENS MIRRORS.

Editor THE AUTOMOBILE:

[1708.]—Will you please tell in "Letters Interesting and Instructive" how to resilver lens mirrors, as the silver backing of the lenses of my headlights has all disappeared, due to their getting too hot? R. H. COOLEY.

Oakland, Cal.

We think the best advice to give you is to recommend returning the lenses to the maker of the headlights, or to some local firm which has facilities for doing this work, as the usual amateur job of this kind calls for an investment in materials and time that is seldom compensated for by the results.

CAN TIRES BE RUN SAFELY WITHOUT CLIPS?

Editor THE AUTOMOBILE:

[1709.]—I find that my tires give much trouble, possibly on account of the weight of my car, and in changing time is taken because the "clips" have to be undone, and the threads of the same become more imperfect every day. Would it be safe to dispense with them? OWNER.

Brooklyn, N. Y.

Some owners of cars do eliminate the tire clips of the front tires, and once in a while the rear tires are so treated. It cannot be said that the idea is a good one, since it is possible for the tires to come off, and in the act do much damage. Tiremakers are competent to decide as to the requirements as a rule, and to comply with their ideas is usually well within the bounds of good practice. If the tires on your car are small for the weight, it is within the bounds of reason to consider an increase.

ANTICIPATING THE SUCCESSFUL AEROPLANE.

Editor THE AUTOMOBILE:

[1710.]—Some time ago while reading "When the Sleeper Wakes," by H. E. Wells, I was struck with the description of the flying machines used by the people of his imagination. For example, he says (Chapter XVI):

"The aeroplanes flew safely only in a calm and moderate wind. . . . The starting of the mechanism was only possible from a gigantic car on the rail of a specially constructed stage."

These aeroplanes were very large and went from London to Paris in 45 minutes. They required similar stages for landing. The aeropiles were smaller, carrying two persons. Note the description, written about 1895:

"Their sails (planes), which were brilliantly colored, consisted only of two pairs of lateral air floats (planes), in the same plane and of a screw behind. Their small size rendered a descent in any open space neither difficult nor disagreeable, and it was possible to attach pneumatic wheels or even the ordinary motors for terrestrial traffic to them, and so carry them to a convenient starting place. They required a special sort of swift car to throw them into the air. Its lateral supporting sails were braced and stayed with metal nerves, almost like the nerves of a bee's wing, and were made of some glassy artificial membrane. The engine was very simple in appearance . . . ; it was of the explosive type, burning a small drop of a substance called 'fomile' at each stroke."

Evidently injection feed. His first sensation was of fear, but this soon changed to desire to stay up indefinitely. Further:

"Steering was accomplished by the opening or closing of one or two thin strips in one or the other of the otherwise rigid wings . . . . During these downward glides the propeller was inactive altogether."

In the arrangement of the planes, the starting mechanism and the pneumatically tired landing wheels he seems to have anticipated some of the latest successful machines. E. T. BIRDSALL.

Rochester, N. Y.

THE AUTOMOBILE

Vol. XXX Thursday, January 14, 1909 No. 2

THE CLASS JOURNAL COMPANY
Thirty-ninth Street Building, 231-241 West 39th St.
New York City

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ENGLAND:—W. H. Smith & Sons, Ltd., 186 Strand, London, W. C., and all their railroad bookstalls and agencies throughout Great Britain; also in Paris at 248 Rue de Rivoli.
FRANCE:—L. Baudry de Saunier, offices of "Omnia," 20 Rue Duret, Avenue de la Grande Armee, Paris.
GERMANY:—A. Seydel, Mohrenstrasse 9, Berlin.

Entered at New York, N. Y., as second-class matter.
The Automobile is a consolidation of The Automobile (monthly) and the Motor Review (weekly), May, 1902, Dealer and Repairman (monthly), October, 1903 and the Automobile Magazine (monthly), July, 1907.

TRUTH EMANATES FROM THE LABORATORY

Appearances do not tell the tale of the qualities residing in materials, and the conventional methods of arriving at the approximate situation are so misleading, in many cases, as to demand that they be used but sparingly. On the other hand, it is rarely that the vendors of materials, especially steel, condescend to enlighten the users sufficiently for the purpose on a basis of safety. It is not to be supposed that the fabricators of steel do not know just about what the materials are good for, nor will it be beneficial to set up the contention that they deem it inexpedient to lay bare the situation.

Whatever may be the situation from the fabricators' point of view, the fact still remains that the users of materials should look out for themselves; for the law says, "the purchaser must look out for himself." Under the circumstances, it is not unbecoming in any user of steel to take up the burden, and, even if the process is of a length and to a depth, give it the benefit of most careful consideration. Because there are phases of the problem that do assume a mysterious form, there is all the more reason why the user of materials should take hold and by a systematic method of procedure arrive at the bottom facts, instead of groping in the dark.

To approach the subject in due form is the only way by which knowledge of the facts will come to light. Due form, in this case, demands that the user of materials shall step out for himself, taking into account pyramided knowledge, the requisite facilities, and a firm resolve to unswervingly advance in the face of every delinquency. That difficulty will beset the onward march, is assured, but the password will be given to all who are worthy, if they persist.

The password, if the maker of automobiles is to be considered, is bound up in a laboratory. It is in the laboratory that the qualities of the materials can be arrived at, and as a result of the investigations there to be conducted the dross will float to the top, ready to be skimmed off. So far, much of the dross has been floated, many things were rendered clear, and the potency of the process is now so self-evident as to be declared a "naked truth."

* * *

THE SOCIETY OF AUTOMOBILE ENGINEERS

When an organization springs into being—spontaneously as it were—and in the course of a few years grows to an extent where it begins to make its influence felt, it may be said with reason that its existence is the outcome of a natural demand. This has been the case with the Society of Automobile Engineers, which is now entering upon its fourth year. Trade associations were quick to realize the great value of cooperation and a mutual interchange of ideas upon subjects of common interest to a number of engineers, but what the industry at large needed was a body whose deliberations were open to all, and the benefits of which could be equally shared by every maker of automobiles.

Experience in other fields of engineering endeavor has shown the necessity for independent investigation, unhampered by trade affiliations, and the great success of the independent engineering organizations that are the outgrowth of more than a quarter century of development, shows that they have met a demand not to be answered in any other way. Exactly the same conditions apply in the automobile field, and it was this need that prompted half a dozen well-known engineers to broach the matter of forming an organization. The result is the Society of Automobile Engineers. Starting with a few charter members in 1905 it now numbers close to 300, and includes in its ranks engineers drawn from every branch of the industry. Its increasing strength tells a story complete in itself. At the end of another year it will be interesting to note the progress made.

* * *

THE NEXT PHASE IS CLOSE AT HAND

Judging from the news that comes from Paris the next phase is near at hand. While it is a certainty that aerial travel will never have any substantial effect upon automobiling in general, it is pretty good guessing that many automobilists will also add aerial skill to their accomplishments.

It was in France that the automobile had its earliest and most rapid progress, and though an American has shown the Frenchmen how to fly, he did so because there was more encouragement offered to him on the other side of the ocean than in his own country. Furthermore, the Frenchmen are taking to aeronautics as readily as a duck does to water, and the first aeronautical exhibition makes apparent the fact that there is going to be no small amount of attention devoted to the aerial problem until it becomes as common as automobiling is to-day.

GIST OF MAKERS' TARIFF BRIEF TO CONGRESS

SIGNED jointly by Henry B. Joy, as chairman of the tariff committee of the Association of Licensed Automobile Manufacturers, and Benjamin Briscoe, as chairman of the committee of management of the American Motor Car Manufacturers' Association, the supplemental brief of the American manufacturers of automobiles expressing them in favor of a protective duty, has been filed with Congressman Sereno E. Payne, chairman of the House Committee on Ways and Means at Washington, and has also been generously distributed throughout the entire country. Pertinent extracts from the brief are herewith given:

The number of people directly employed in motor-car factories is upward of 100,000, and the number of others employed in the allied industries is being compiled for your committee.

The number of establishments allied with this industry and more or less dependent upon their success is approximately 4,000.

Foreign manufacturers are protected in their patent rights in America, while American manufacturers must manufacture abroad in order to retain their foreign patent rights.

The price of labor in America is two and one-half times as much as it is in Europe, and the cost of selling in America is one and one-half times as much as it is Europe, while the cost of technical employees is twice as much here as in Europe. We do not at this time enumerate the difference in the cost of material, advertising, rents, insurance, or all overhead charges.

If the tariff is to be primarily adjusted at the difference between wages paid here and abroad, then the tariff should be 60 per cent. instead of 45 per cent. This is not the desire of your petitioners. We seek to have automobiles specified as such in the tariff bill itself, and not governed as now by a tentative ruling of the Treasury Department. While the present duty of 45 per cent. may not be a sufficient protection as time goes on and trade conditions change, still the industry itself should by its own strength be able to meet these emergencies. As a matter of fact, the industry is still in such a condition of early growth that final figures can not be made absolute on an exact rate of full protection in the tariff.

The fact of overproduction and the alarming commercial conditions prevailing at present in this industry abroad is shown in the reports from the automobile shows in London and Paris in the various foreign trade publications.

Individuals are allowed to import a single machine purchased abroad and to bring it in under section 19, when the law is clearly defined on actual purchases under sections 3 and 4. This alone has made a difference in revenue to the Government of over $200,000, and given to the foreign manufacturer an unfair advantage over the American manufacturer and dealer.

What the Treasury Ruling Now Permits.

The report then goes on to say that a treasury ruling permits an examiner to place a value upon machines used for a period of less than a year abroad, and it is suggested that some arbitrary rule be adopted, governed by the length of ownership, number of miles traveled, condition of the vehicle, or all three.

Especial attention is called to the evasions of regulations T. D., 23,743 and 26,162, by false representation of alleged racing and touring cars. Cars are claimed to be regularly imported, exposed for show purposes, and sold. Under these regulations an importer is enabled to expose for sale imported racing or touring cars for three months after importation without the payment of duty. The only penalty provided is the payment of the duty or the exportation of cars.

A 40-horsepower Fiat car, made in Turin, Italy, is now entered at the port of New York at 8,000 francs net, and 150 cars of this make have been imported, consigned to an Italian banker. The close alliance existing between this banker and the Fiat Automobile Company of New York is deducible from a letter from the latter to the Mayor of Detroit, dated December 21, 1908, in which it is said that a large factory may be established in this country.

"The foregoing automobile is offered for sale in this country at $6,000, with body and equipment, and $5,000 for the chassis alone," states the brief. "Agents receive a discount of 20 per cent. from the last price, leaving a net selling figure of $4,000 and a profit of $1,600, less a trifling cost of mudguards and running boards. The importer has this margin with which to undersell American competitors.

"Similarly the Lancia car, made in Italy, is offered for sale in France, England and Italy for $2,000, and after adding 45 per cent. duty and 5 per cent. import charges, is offered in this country, similarly equipped, for $1,800—or $200 less than its parallel selling price abroad."

Aggregate Value of Imported Vehicles Reduced.

Following is quoted entire from the brief:

In view of the fact that the aggregate value of imported vehicles between 1906 and 1908 has been reduced almost 50 per cent., and between 1907 and 1908, 26 per cent., and the average value per vehicle for a corresponding period shows a respective reduction of 40 per cent. and 30 per cent., we urge upon your committee the imperative necessity of such provisions in the interpretation of the words "market value" as will entail the requirement of certain specific rulings under certain conditions without permitting the exercise of discretion by the administrative officers of our ports. There has been a constant growth in importations, increasing yearly in volume, decreasing yearly in average value. We refer you also to the statistics of imports compiled by the Department of Commerce and Labor.

The retail value of foreign cars sold in America during a period of six years, with additional parts, is approximately $52,677,046. The value of American cars sold in America for a corresponding period is approximately $250,000,000.

A motor vehicle of any kind can be made in Europe certainly for 60 per cent. of the cost thereof in America, including the manufacturer's profit, as shown in the Fiat case, and by the figures on cost of materials and labor.

We particularly point out that Charles H. Sherrill, representing the importers, and especially the Fiat Company, of Italy and America, stated to your committee that the tariff ought to be reduced to 33 per cent. In other words, such a rate of tariff would be satisfactory to the Italian company as giving it free access to the American market.

It is further of the utmost importance to note that Mr. Sherrill also admited that the 40-horsepower Fiat chassis, which we referred to in our preliminary brief and which we refer to again in this brief as being imported at a customs value of $1,800, was actually imported at a customs value of $1,600, and he further stated that this sum of $1,600 was the full and total sum which went abroad in full payment of the 40-horsepower chassis referred to. We direct your attention especially to a complete and detailed refutation of erroneous statements made by Mr. Sherrill in his hearing before your committee, in the attached appendix and exhibits referred to therein.

We wish most urgently to impress upon your committee that with 60 per cent of American cost a tariff of 65 per cent., plus 5 per cent. freight and import charges, would still permit a European manufacturer to place his product on the American market at 102 per cent. of the American cost—only a margin of protection of 2 per cent. If, however, you assume that average European costs are 65 per cent. of American costs (though American workmen are entitled to protection against the cheapest labor and not the average labor), then a tariff of 45 per cent., plus 5 per cent. for freight and import charges, would put foreign cars on the American market at 97 1-2 per cent. of the American cost.

In Reference to the Commercial Vehicle Industry.

Next, the commercial vehicle industry is taken up, this including trucks and the very freely imported taxicabs. It is insisted that this infant industry requires the same protection accorded the pleasure cars; viz., 45 per cent. duty, for the reason that the industry is still in a state of evolution, involving much present and future experimentation before arriving at a marketable product.

In support of this, it is stated that the Packard Motor Car Company, while asking $3,700 for its three-ton truck, will be obliged to sell hundreds of them in order to make a profit, due in part to the cost of equipment. At this price, an agent's discount of 10 per cent. must be deducted.

On the other hand, the De Dion-Bouton Company, of Paris, is marketing a three-ton truck here valued at $2,500, which, with duty and import charges, is placed on the New York market at $3,700, including both manufacturer's and selling agent's profits.

Then the brief goes on to say:

That note be taken of the fact that our rate is only 10 per cent. higher than the Canadian tariff rate. Even considering Canada's cheaper labor and lower manufacturing cost, they find it necessary to impose a tariff rate nearly equal to our own, and further safeguard their interests by "dumping duty," which is graduated to protect against overproduction and special expert prices abroad.

Automobiles are subject to a duty of 45 per cent., and section 19 provides, whenever imported merchandise is subject to an ad valorem duty based upon the value thereof, the duty shall be assessed upon the actual market value.

Concerning the German Trade Agreement.

The German trade agreement, April 22, 1907, provides: "Market value shall be construed to mean the export price whenever merchandise is sold wholly for export, by reason of which facts there cannot be established a market value based upon the sale of such merchandise in wholesale quantities, packed ready for shipment to the United States."

Thus foreign trade agreement is absolutely contrary to the provisions laid down by Congress.

We protest against reciprocal trade relations as advocated by agricultural implement manufacturers. It seems unjust and unrighteous to remove an adequate protective tariff from one industry in order to induce some foreign government to reduce its rate of tariff on some other American product. The slaughter of one industry for the benefit of another is not in accordance with wise protection.

Again, section 11 provides how customs officers may arrive at market value, but the German trade agreement provides: "The certificates as to value issued by German chambers of commerce shall be accepted by appraisers as competent evidence."

This abolishes the legal requirement of both sections 19 and 11. It is thus possible to make the value of a foreign motor car for import purposes any price which a foreign chamber of commerce will certify to. This mode of undervaluation is being used to-day, thus defeating the entire intent of the American protective tariff.

Statistics of the American Industry.

The National Association of Automobile Manufacturers is described in the brief as composed of the members of both the other organizations and of a number of other manufacturers not affiliated with either organization. The American Motor Car Manufacturers' Association is composed of 44 manufacturers who do not recognize the validity of the Selden patent. The Association of Licensed Automobile Manufacturers is composed of a group of 30 automobile manufacturers of America who recognize the validity of the Selden patent and pay royalties thereunder.

Next follows this general summary of the condition of the industry, accompanied by statistics of its expansion:

About 80 of the American firms engaged are marketing a product that is of some importance to the trade. About 10 per cent. of the whole number (25) have so far, possibly, made a commercial name, but we doubt if even 20 manufacturers can show a fair profit.

Notwithstanding the great number of machines sold and the amount of money invested, it is a fallacy in the public mind that the manufacture of automobiles represents a very large profit. At least 90 per cent. of the manufacturers of automobiles in this country are not to-day making manufacturing profits, and but few concerns engaged in the business have been in any sense successful. This is not because of poor business management, but on account of the large amount of capital required in the experimental and development stages to bring the industry to its present condition and the many unusual risks incident to the conduct of a business of this character. The industry is profitable only in the event of there being an especially desirable product combined with ample capital, skill, and foresight, and a selling ability properly proportioned to market a large product. A record of the development of the industry is submitted herewith:

In 1902:		
Concerns in business	51	
Discontinued that year	18	
Concerns carried over into 1903	33	
Increase during year		33
In 1903:		
Concerns started up	71	
Discontinued the same year	30	
Concerns carried over into 1904	74	
Increase during year		41
In 1904:		
New concerns started	54	
Discontinued	40	
Concerns carried over into 1905	88	
Increase during year		14
In 1905:		
New concerns	51	
Discontinued that year	38	
Carried over into 1906	101	
Increase during year		13
In 1906:		
New concerns	43	
Discontinued	29	
Carried over into 1907	115	
Increase during year		14
In 1907, new concerns		51
		166

Note.—Of the 51 concerns in business in 1902 only 21 survive and are in business to-day.

And, Finally, the Conclusion of the Brief.

In closing our appeal for an adequate protective tariff and adequate means for enforcing the intent of same we respectfully submit that it is our desire to ask only a sufficient and adequate rate of tariff and such a wise and proper classification as will promote the best interests of the motor-vehicle industry and those industries allied with it. We believe our statements and allegations are correct and founded on facts. We believe in the sound wisdom of the tariff protective policy of our country. We believe that tariff revision means exactly what it says, namely, that it is the intent of the people of the United States, of the Congress, and of the President-elect Taft, to have the tariff so revised as to justify the continued upbuilding of, and investment of money in, American industries under American wage conditions as they exist to-day, whether it may require increases or decreases of rates, or the maintenance of existing rates.

Respectfully submitted,

HENRY B. JOY,
President Packard Motor Car Company and Chairman Tariff Committee of Association of Licensed Automobile Manufacturers.

BENJAMIN BRISCOE,
President Maxwell-Briscoe Motor Company and Chairman of Committee of Management of American Motor Car Manufacturers' Association.

WHAT NEW JERSEY'S GOVERNOR NOW SUGGESTS

TRENTON, N. J., Jan. 12.—Gov. Fort in his message to the Legislature suggested that special regulations in the open country should be liberal, and that 30 miles an hour could safely be permitted instead of the present maximum of 20 miles.

The disappointing feature of his recommendations is that he cannot yet see his way clear to suggesting a reciprocity in registrations with other States which now can be entered by New Jersey automobilists because of their home registrations. The Governor recommends, however, that a more simple and easy method of procuring a license be especially provided for non-residents. Among other things he says:

"The automobile is with us and it has come to stay. It must be given all highway rights, under proper restrictions to protect the public and the occupants of the machine. Railroad regulations as to the running of trains, safety appliances and the like are intended for the protection of the passenger more, if anything, than the traveler crossing the track. All vehicles upon the public highway should be required to carry lights. Arrest and trial should not be summary, but the right to stop should only exist to inquire as to the possession by the driver of the machine of the requisite authority or to obtain its number if violation of law be claimed.

"Suit should only be instituted by direction of the department in proper courts near the residence of the alleged offender or at convenient points within the State for the non-resident. Wilful injury to person or property by the driver of a car, or such injury by an intoxicated driver, should be a misdemeanor and punishable accordingly, without of course the loss of right to maintain a civil suit by the injured party or the owner of the damaged property. The present license fees are not excessive and should not be modified by any reduction unless it be through some system of uniform legislation between the States."

REVISED RESULT OF QUAKER CITY ENDURANCE RUN

PHILADELPHIA, Jan. 11.—As a result of successful protests by several of the contestants in the New Year's endurance run of the Quaker City Motor Club, there have been not a few changes in the final standing, and even this may not be final, for at least one of the contestants has carried his case to the A. A. A. and others may do likewise.

When the first finish results were posted, the Oldsmobile people got busy on Monday and proved that Folberth and Berger, drivers respectively of Nos. 12 and 23, had been held up on Giant's Despair through being blocked by the Acme (No. 4). They were consequently relieved of demerits, which place them in second and third places, respectively. Folberth got rid of 220 bad marks and Berger 371. Laurent Grosso's Stearns, No. 24, moved up from ninth to fourth place when the committee relieved him of 219 road demerits. These successful protests pushed the Dietrich-Matheson, with a total of 37 penalties—all technical—down to fifth place.

The revised order of finish brought forth another cloud of protests, and on Wednesday afternoon a special meeting of the contest committee was held to thresh out the whole matter. As a result of the testimony adduced there four Class A cars were

Matheson No. 7, Winner of the Quaker City Endurance Run.

This photograph was taken on the return of the car to Wilkes-Barre after the race. Reading from left to right, those in the tonneau are: W. Miller, driver; Harry Sidel, timekeeper; A. T. Stewart, representing MacDonald & Campbell, donors of the Quaker City cup; F. M. Kirby, owner and entrant; F. F. Matheson, general manager of the Matheson Company; Jack DeWitt, mechanician, and C. W. Matheson, president of the Matheson Company.

disqualified entirely—Tuttle's Stoddard-Dayton, No. 13; Carris' Franklin, No. 10, which had been originally placed No. 2 at the finish; Darnstaedt's Rambler, No. 19; Ray McNamara's Premier, No. 21—either for receiving outside assistance in climbing Giant's Despair, for getting up the mountains sans passengers, or both.

The Premier people were represented by an attorney, John Handy Hall, and he and the Quaker City Motor Club's legal sharp, G. Douglass Bartlett, had a lengthy battle. The Premierite's testimony showed that while the car had run a short distance—probably 50 yards—without its passengers, the driver had done so with a clear understanding that such a proceeding was justifiable, in the event that it was found impossible to secure traction otherwise; that, in response to a query the night before, Dr. J. R. Overpeck, a member of the committee, had declared that the unloading of passengers under such conditions on a slippery hill would not be punishable. On the ground that the Premier had gone passengerless farther than was necessary to secure traction, the committee voted to disqualify the car. Attorney Hall immediately gave notice that an appeal would be carried to the A. A. A. in order to secure the Premier's rights. On the face of the reports the 18-points penalty accumulated by the Premier from the checker's cards would give that car fourth place if the appeal to the national body is successful.

The overwhelming Matheson success, which the first decision of the contest showed and which was somewhat dimmed by the success of the Oldsmobile and Stearns appeals, was still further marred by the imposition of additional checkers' penalties on the Anderson-Matheson, No. 15, which the cards showed had checked in ahead of time at one or two controls. The additional demerits, with the "butting in" of the Oldsmobiles and Stearns, put Anderson in sixth place and the last of the Matheson trio instead of second.

As finally reckoned out, the final standing (barring the result of the Premier appeal) is as follows:

CLASS A.

No.	Car.	Driver	Ch's.	Obs'rs.	Tech'l	Total
7.	Matheson	Miller	0	1	10	11
12.	Oldsmobile	Folberth	0	4	9	13
23.	Oldsmobile	Berger	5	0	10	15
24.	Stearns	Grosso	0	1	29	30
6.	Matheson	Dietrich	0	0	37	37
15.	Matheson	Anderson	44	3	23	70
3.	Cadillac	Burnshaw	43	1	37	81
10.	Mitchell	Freitag	110	2	15	127
2.	Cadillac	Crawford	112	0	23	135
8.	Stoddard-Dayton	Shirk	37	77	26	140
14.	Studebaker	Yerger	189	2	4	195
4.	Acme	McCormick	236	2	31	269
20.	Maxwell	Bitner	441	34	265	758
5.	Elmore	Hardart	Out.			
9.	Mitchell	Cram	No observer's cards.			
11.	Winton	Depew	Out.			
13.	Stoddard-Dayton	Tuttle	Disqualified.			
16.	Franklin	Luckenbach	Out.			
17.	Winton	Schenck	Out.			
18.	Franklin	Carris	Disqualified.			
19.	Rambler	Darnstaedt	Disqualified.			
21.	Premier	McNamara	Disqualified.			

CLASS B.

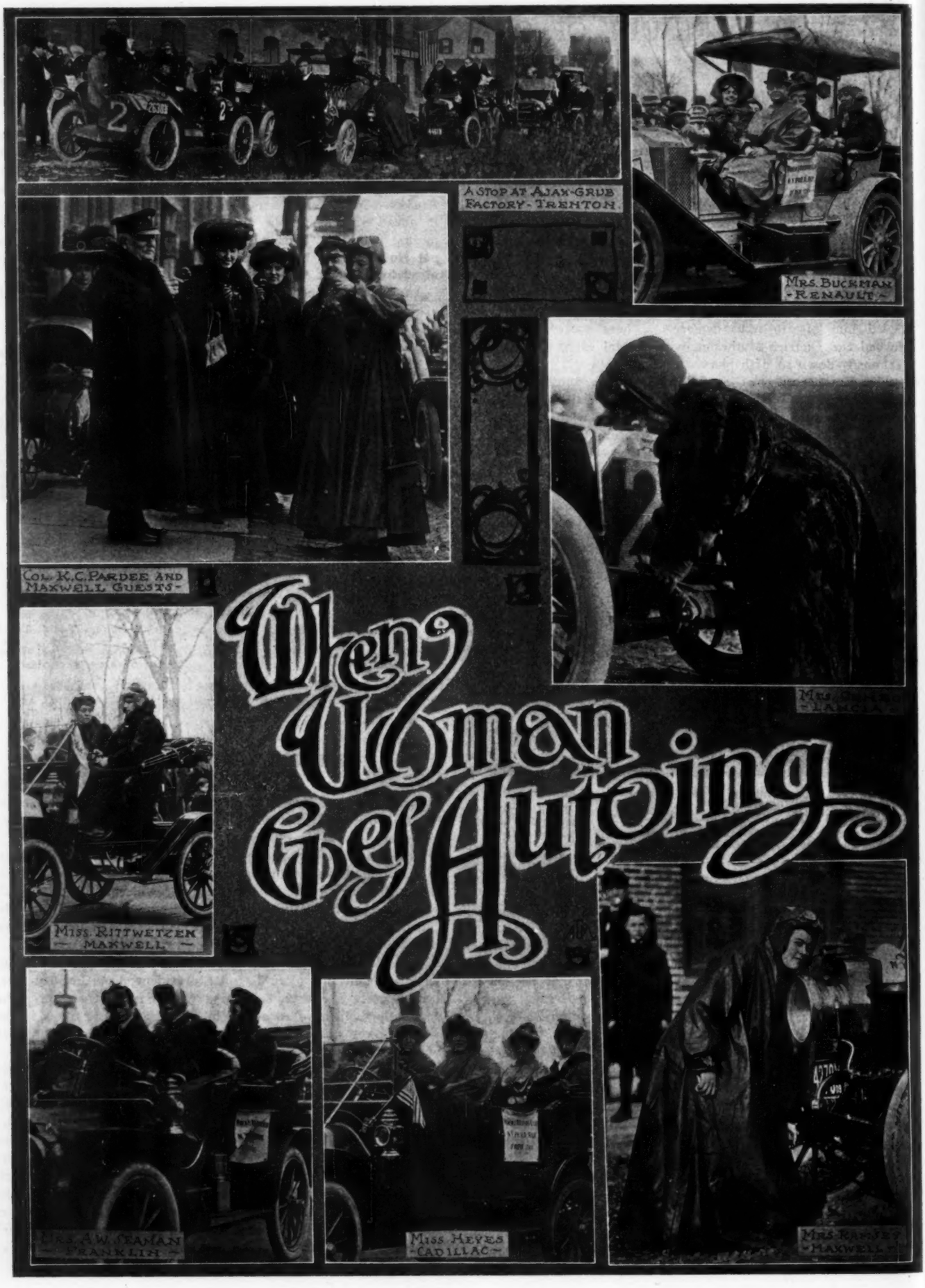
No.	Car.	Driver	Ch's.	Obs'rs.	Tech'l	Total
5.	Peerless	Brooks	26	2	22	50
4.	Maxwell	Longstreth	163	1	75	239
1.	Stoddard-Dayton	Harkins	No observer's cards.			
2.	Mitchell	Borie	Out.			
3.	Oldsmobile	Webster	Out.			
6.	Knox	Bourque	Out.			
7.	Rambler	Brown	Out.			
8.	Buick	Wilkie	Out.			

THE NEWS FROM TIRETOWN.

AKRON, O., Jan. 10.—Tire manufacturers are estimating that the total value of their product here this year will almost equal $15,000,000. Notwithstanding the depression of the past two years, the season of 1908 was a record-breaker for tires, and a bright outlook for this class of rubber products is looked for. Manufacturers returning from the Palace show estimate that the number of cars to be sold this year will equal 75,000, which will tax the tire plants. The manufacturers will not only be called upon to furnish tires for the new cars, but the cars now in use, believed to number 150,000, will require many tires.

The Akron Automobile Dealers' Association has been organized by the election of E. T. Jones, president; Fred Feckley, vice-president; L. J. Fritsch, secretary; J. M. Sauder, treasurer. The association will have an automobile and motor boat show in the East Market street rink, January 28, 29 and 30. Motorcycles will also be shown.

The Firestone Relief Association has perfected its organization by electing the following officers: President, J. S. Hill; vice-president, Daniel Goodenberger; recording secretary, James R. Neely; treasurer, George Kelly; financial secretary, Lee Clough; captain, Cyrus Reading; trustees, William MacAllister, Charles H. Gardner and William Heller. During the course of the exercises, President H. S. Firestone addressed the members, which is composed of employees, and presented the association with the company's check for $500. Mr. Firestone recommended that when members leave the employ of the company their membership shall lapse after a certain time in order to make the association restrictive as much as possible.


A STOP AT AJAX-GRUB FACTORY - TRENTON
MRS. BUCKMAN - RENAULT -
COL. K.C. PARDEE AND MAXWELL GUESTS -
When Woman Goes Autoing
MISS. RITTWETZEN - MAXWELL -
MRS. A.W. SEAMAN - FRANKLIN -
MISS. HEYES - CADILLAC -
MRS. RAMSEY - MAXWELL -

WOMEN HAVE A NEW YORK–PHILADELPHIA ENDURANCE RUN

ONCE upon a time, not so very many years ago, a score or more of so-called automobiles, driven by would-be automobilists, attempted to make a journey from New York to Philadelphia in one day. It was a hard struggle, and the derelicts were strung along the road between the metropolis and Quakertown, the conclusion having comparatively few survivors. That was the first real long run ever undertaken in this country, the event having been the initiatory of the industry as well as the first effort of the Automobile Club of America.

On Monday morning of this week there started for Philadelphia ten automobiles with drivers of the fair sex at the wheels, and the whole ten comfortably reached Philadelphia in the shank of the evening, despite the rough roads and weather that was a close approach to Winter. As things are rated nowadays in automobiling, it was not such a much of a run, but at the same time the "Women's Motoring Club" demonstrated that the driving of an automobile is a task which is not beyond the capabilities of the so-called weaker sex.

The "stunt" may have looked considerably like an advertising proposition, but even so it was cleverly accomplished, and the two-day run must be looked upon as a happening which adds to the evidence of the universality of motor-driven transportation as advancing with bounds. "Alex" Schwalbach was most of the "committee," with "Senator" Morgan interested.

Officially started by E. L. Ferguson, who "checks out on the Glidden tour," and supplied with real route books, these ten started Monday morning with other escorting cars from the Plaza Hotel bound for the Hotel Walton in Philadelphia.

1. Maxwell runabout—Mrs. J. R. Ramsey, Hackensack, N. J.
2. Lancia "Lampo" runabout—Mrs. J. N. Cuneo, Jamaica, L. I.
3. Maxwell runabout—Mrs. L. Gillespie, Poughkeepsie, N. Y.
4. Franklin four-cylinder—Mrs. A. W. Seaman, Brooklyn, N. Y.
5. Renault "23" touring car—Mrs. E. M. Beeckman, New York.
6. Maxwell runabout—Miss B. M. Rittwetzen, Huntington, L. I.
7. Cadillac four-cylinder—Miss Alice D. Heyes, New York City.
9. Maxwell runabout—Mrs. J. G. Kirkman, Brooklyn, N. Y.
11. Maxwell—Mrs. P. Bach, Newark, N. J.
12. Maxwell four-cylinder—Mrs. E. G. Gresh, Norristown, Pa.

In the run to Philadelphia on Monday the weather was quite comfortable. En route the party was entertained at the Ajax-Grieb Rubber Company plant in Trenton, President Horace De Lisser being the host of the occasion. The first to arrive at the Philadelphia city line was Mrs. Cuneo, who was one hour ahead of the schedule. Dr. J. R. Overpeck, of the Quaker City Motor Club, escorted the participants to the Hotel Walton, where in the evening Mayor Reyburn contributed an address of welcome.

The return journey of Tuesday was not quite as enjoyable as the outward trip. At New Brunswick a light but cold rain was encountered, and these conditions continued to the conclusion. At Trenton Governor Fort had socially said, "How do you do?" and at Grant City on Staten Island the Richmond County Automobile Club supplied a luncheon.

The first one to arrive at the Plaza Hotel was Mrs. Cuneo, whose clever handling of the Lancia "Lampo" was a feature of the run. In connection with her driving of this car, attention might be called to the fact that this winner of the light car race at Savannah is "stock," for Lancia only supplies one type of engine as to bore and stroke, viz., 90 mm. bore and 100 mm. stroke. This is the size of the four-cylinder "Lampo" type roadster, and even the cylinders of the "six" are all the same. The only actual difference in the "Lampo" engine from the others, to be exact, is asserted to be the method of timing and slightly increased valve area, which is a combination that permits the motor to run at considerably higher speed. In this manner Lancia claims to secure his greater speed results, for no devices are utilized to increase the compression.

After the participants had been "checked in," it was announced that the selection of the prize winners might not be determined for several days.

The Maxwell-Briscoe Motor Company offered a bronze trophy to the driver of the Maxwell car making the best showing, and the Hol-Tan Company offered a silver cup, though Mrs. Cuneo was barred from competing for it. No matter who wins the prizes, all the survivors made a most excellent showing and demonstrated that the driving of an automobile has become a task well within the ability of the average woman.

INDIANA MAY HAVE AN AUTOWAY.

INDIANAPOLIS, Ind., Jan. 11.—With the purchase of a large tract of ground northwest of the city by a number of automobile men, plans for an automobile race course that may attain a national reputation have become known. A company is to be formed at once, the proposed capital stock having all been subscribed and work on a twenty-six mile course will be started.

As planned, the tract of ground will provide an oblong track, two miles around the outer edge. It will wind towards the center, making a course twenty-six miles long. An ampitheatre will be built, from which it will be possible to watch the contesting cars at all parts of the course.

Improvements are to be made that will cost $250,000 on the course, which is one mile long and one-half mile wide. The plans include a union station, as the course touches a steam railroad and an electric interurban line.

Carl G. Fisher, a local automobile dealer, is father of the project. With George M. Schebler and James A. Allison he has carried out the preliminaries, each investing $15,000. Other automobile men are also interested in the project.

The course will be located near Riverside Park, just northwest of the city. The promoters estimate that cars can attain a speed of 120 miles an hour on the outer portion of the course and sixty miles an hour on the inside track, and there will be practically no danger of accidents to spectators because of the peculiar arrangement of the track. Work on the course is to be started at once.

WASHINGTONIANS ELECT OFFICERS.

WASHINGTON, D. C., Jan. 10.—The annual meeting of the Automobile Club of Washington resulted in the following officers for the ensuing year: President, W. D. West; vice-president, O. J. DeMoll; secretary, John K. Heyl; treasurer, H. C. Chandlee; captain, J. A. Muehleisen; lieutenant, Lester D. Moore, Jr.; governors, R. B. Caverly, W. W. Chiswell, Fulton R. Gordon and J. M. Stoddard. The reports of the retiring officers indicated that the club was in a flourishing condition, the membership having increased from 69 to 130 during the year. Plans are on foot for increasing interest in the club and the new officers have promised they will leave no stone unturned.

BALTIMOREANS WANT A SHOW.

BALTIMORE, Jan. 11.—At the regular fortnightly meeting of the Automobile Club of Maryland the past week, D. C. Walker was appointed chairman of a committee to work up plans for an automobile show to be given under the auspices of the club. The main obstacle in the club's way at present is the securing of ample quarters for holding the affair. The committee is now looking around for a place large enough for a show. Should they be successful it is the idea of the club members to have the exhibition take place about February 24.

The club appointed a committee to co-operate with the national roads committee of the American Automobile Association, with Benjamin Friedenwald, of Baltimore, as chairman.

C. H. METZ ACQUIRES WALTHAM PLANT.

WALTHAM, MASS., Jan. 11.—By his acquisition of the Waltham Manufacturing Company's plant, C. H. Metz returns to the control of a plant that he was largely instrumental in developing in its early days, and will be the largest individual operator of an automobile plant in this country, as he is planning to turn out 5,000 cars. The Waltham Manufacturing Company was organized by Mr. Metz in 1893, and he then startled the bicycle riding fraternity by bringing out a 21-pound machine that was guaranteed to stand up under any condition of road, load or speed. The novel features first brought out in the Orient bicycle of that day are still said to be standard in bicycle construction at the present time. Thousands of the machines were sold, and four years later Mr. Metz parted with his controlling interest in the company.

The Waltham Manufacturing Company was the first in this country to take up the manufacture of automobiles using the Daimler motor. One of Mr. Metz's hobbies was the Orient bicycle, which used the Daimler type of motor, and in order to develop it according to his own liking, he severed his connection with the company altogether in 1901 and began building motorcycles on his own account. Subsequently he became affiliated with the American Motor Company, manufacturing the Marsh-Metz motorcycles. It is said that the car Mr. Metz is planning to produce in the Waltham factory will embody many features of light weight and strong construction.

The chronology of Mr. Metz's experience in the bicycle and automobile industry is interesting and is accordingly given below:

1883 Local sales agent for Columbia machines.
1885 Champion bicylist of Central New York—home in Utica.
1886 Manufacturer of bicycle attachments.
1889 Joined Union Cycle Company at Highlandville, Mass.
1890 Led crusade for lighter bicycle construction.
1891 Invented Dunlop detachable tire principle.
1892 Joint interest in Dunlop tire patent sold for $100,000.
1893 Organized Waltham Manufacturing Company.
1894 Produced lightest practical roadster bicycle.
1895 Output increased to 1,500 machines.
1896 Output increased to 4,500 machines. Made 4, 5 and 6-seated bicycles. Famous through their use in pacing world's champion riders.
1897 Output reaches 15,000 machines. Made 10-seated bicycle—the Oriten—the largest bicycle ever built.
1898 Made automobiles. Produced the first motorcycle in America.
1901 Severed connection with Waltham Manufacturing Company. Became technical editor on staff of "C & A Trade Journal."
1902 Built Metz motorcycles. Made American record for one mile on Staten Island—time, 1-10 2-5.
1903 Introduced grip control and other original motorcycle features.
1905 Affiliated with American Motor Company.
1906 Developed Marsh-Metz motorcycle.
1907 Introduced new features in Marsh-Metz construction.
1908 Developed Metz plan car.
1909 Acquired plant of Waltham Manufacturing Company.

Thus it would appear that Mr. Metz has qualified for a still greater success by his long and varied experience.

GOODYEAR SEEKS TO PREVENT PRICE CUTTING.

AKRON, O., Jan. 11.—As a result of the more or less recent formation of several organizations, the chief object in life of which has been the supplying of accessories at cut prices, and particularly tires, the Goodyear Tire & Rubber Company is taking steps to protect its dealers against competition from this source. In a circular letter it calls attention to the "International Automobile League," Buffalo, N. Y.; "Co-operative Auto Association of America," New York, and the "Bureau of Automobile Auditors," also of New York. These organizations advertise that they are able to supply tires and other supplies to the consumer at dealers' prices, and to do this it is necessary that they should be able to obtain trade discounts through certain dealers.

In order to put a stop to this practice the Goodyear company is requesting its dealers to inform it of the serial numbers of tires thus purchased that have come under their notice. By this means it will be possible to trace the original purchaser of the tire and thus determine the channel through which it reached the price cutting association. Trade prices will be immediately withdrawn from any dealer who is found to be selling Goodyear tires in this manner, and he will be placed upon the same basis as the consumer.

KISSELKAR "CLIMBS" A 14-STORY HOUSE.

As a result of a wager, a 30-horsepower KisselKar "climbed" to the upper levels of the new Fifth avenue building, now in course of construction on the site of the old Fifth Avenue Hotel at Twenty-third street and Broadway, one day last week. But the car did so at the end of four stout steel hooks attached to it, and forming parts of a four-piece bridle at the end of a steel cable and hoisting engine, and thereby hangs the tale.

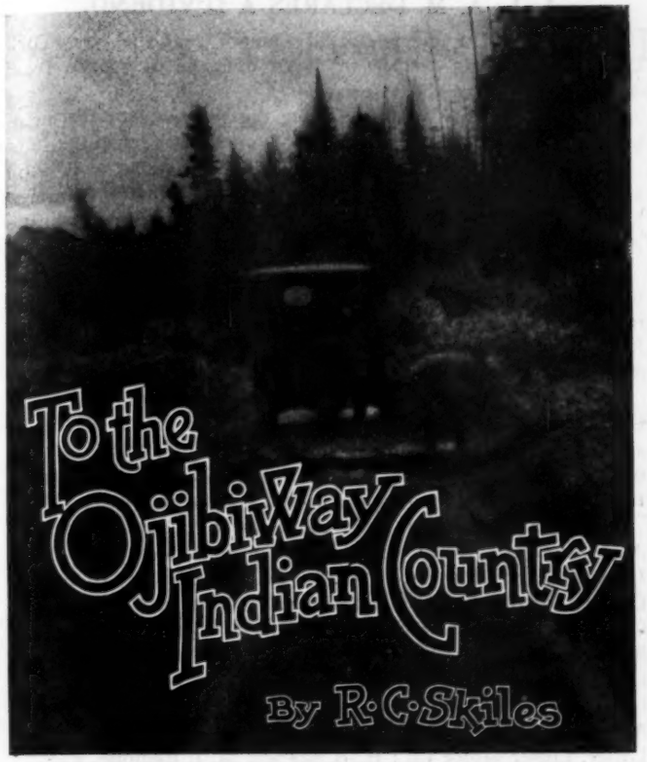
It seems that F. S. Dickinson, manager of the New York branch of the KisselKar company, of Hartford, Wis., and F. J. Wagner, the well-known race starter, had slightly different opinions on the subject of climbing. Mr. Dickinson was quite certain that the Model LD-9 30-horsepower KisselKar, which is the $1,500 offering of that company for 1909, was the greatest hill-climber ever, and that there were few things it could not romp up "on the high." "Wag" dissented, which statement led to the wager aforesaid. A 30-horsepower KisselKar runabout

F. S. Dickinson's KisselKar Aloft in Madison Square.

of the type in question was driven down to the new Metropolitan tower, for Wagner had ambitions to climb the highest building he could find. The hoisting lines were attached and everything was about ready to take the car and its passengers aloft, when the officials of the Metropolitan happened along for the purpose of inspecting the new chimes that are to hang in the tower. They immediately put a stop to the "stunt," in view of the hazardous nature of the undertaking being contrary to their principles, and an adjournment was taken to the new Fifth avenue building on the other side of Madison Square, with better success, as the photograph demonstrates.

GRAY & DAVIS SECURE WRIDGWAY LICENSE.

Gray & Davis, the well-known automobile and carriage lamp makers, of Amesbury, Mass., have secured the license to make the Wridgway Non-Glare Shade, and the firm is the only lamp manufacturer to receive such a license. Recently an ordinance was passed in New York City prohibiting the use of searchlights in city limits, unless properly subdued in such manner as not to interfere with other users of the road.



To Reach this Beautiful Country Requires Work.

IT was in company with my wife that on a pleasant morning of August—the 13th, to be exact, for we were not superstitious—that I began a drive from Shelby, O., to the north of the Ojibiway Indian and the historic Hudson Bay country. From Shelby to Cleveland to Buffalo, the miles were traversed by our four-cylinder Buick without an accident worth the mention. Then we visited the cataract of Niagara and crossed into Canada, first going to Hamilton and then to Toronto, where we were told it would be folly to drive any farther north than Gravenhurst, at the foot of the Muskoka lakes and in the heart of the game-fishing region.

Gravenhurst is a long way from North Bay, Ontario—which is on Lake Nipissing, the supply station for the Cobalt, the destination we had in mind—and we determined to get as near there as possible. So with thorn and waterproof clothing, plenty of oil and gas, and a good toolcase, including an ax, which I purchased in Toronto, we left Gravenhurst, the end of good roads behind us. As far as Bracebridge, some 10 or 12 miles farther north, we followed the Ontario Motor League guide book over a very stony road, which was a constant climb of the Ontario highlands toward the height of land. The guide book gave a very attractive route through to North Bay, with an encouraging footnote, "Good roads the whole way," and believing this authority to be reliable, we left Bracebridge confident of an easy trip. At the first stop for water a Hebrew peddler was encountered who had traveled the country by wagon to within 60 miles of North Bay, and he advised me to take a different road from the one given in the guide book, so his route over the old Parry Sound road was very fortunately taken. This peddler was of service to us, and we thanked him, but we fear that another road peddler whom we met did not thank us. His horse was frightened and bolted. As the horse running away passed us, we heard the peddler say to him, "Wait a minute, Jack"! Rather a peculiar request to make of a horse that was running away!

Through country that would seem impassable to the average autoist, the road climbed up to the highlands in the beautiful Lake of Bays district, where out from behind every hill a clear little lake lay shimmering in the sunlight. Even this far along an automobile was a curiosity, but the people could call it by name, which was more than the more northern settlers could do. After a hard drive from Gravenhurst for seven hours, we reached Huntsville. We had covered only 33 miles. The next day, between 9 A. M. and 4 P. M., the car climbed over rocks and up hills, occasionally passing through a lumber camp, to South River, 60 miles nearer the cherished destination, but where we were told that we could go no farther. Two cars made the attempt last year, but failing to climb the noted South River hill, turned back. This was cheering information, but after sleeping over the prospect of taking the hill and getting over the roads beyond, I decided to make the effort, and in case of failure, store the machine at South River, and go on by the Grand Trunk Railroad to North Bay.

Leaving South River at 8 A. M. in a pouring rain, we started for the big hill, four miles out of town. The approach to it was over stones and loose corduroy, with no opportunity to get up speed. The hill itself was of wet, slippery yellow clay covered with loose stones, and two abrupt turns had to be made before the summit was reached. The car made a brave fight with the rocks and mud until the first turn was reached, and there the danger of skidding down the abrupt mountain side was so great that we backed the machine down and cut by hand a space large enough to turn around in. Sorely disappointed, we drove back to South River, not to store the car, however, but to wait for a dry day, when I was confident the climb could be made. Upon reaching the town a bystander suggested that we try the "winter road," and thus avoid the hill. Eager to make North Bay and blissfully ignorant of the character of a "winter road," we made a second start. The first few miles was over the usual hills, stones and corduroy into a forest that gradually grew more and more dense. Suddenly the beaten track seemed to end and the forest closed in upon us, but since there was no place to turn aside, we kept on, sometimes plunging down the rocks into a bed of spongy moss, sometimes climbing up the rocks into the low hanging clouds, but scarcely ever going more than five feet without stopping to figure out the best way to drive the next five. Stumps and fallen timber soon came to be trifling obstacles, for they would yield to the ax, but the boulders were a very different problem. They were so many and so high that in places where the car would not clear them or where it was not possible to chop a way around them, the wheels would have to be jacked up, filled under with brush and then driven over. After fifteen miles of such driving we came out into the light of a small clearing, where a wood cutter with his wife and eight small children lived in a little cabin. Having never seen an automobile before they were almost speechless with fright, and unable for a time to respond to a request for water, which the engine was thirsting for. It seems no one had tried to get over the road since winter, when, as was learned later, the cleared path is filled in with brush after the first snowfall, then sprinkled with water, which, freezing, forms an ice road for the lumbermen's sleds. This lone inhabitant had made

Farthest North—Note Other Horseless Carriage.

a slightly better clearing, for his own use, to Tout Creek, some seven miles further, where the South River hill road was met. From there on the track was clearer and easier to distinguish, having been surveyed by the Bell Telephone Company, which is putting a line through to the Cobalt.

At six o'clock that night the faithful old car climbed over the last hill and down the rocks into North Bay, where no automobile had ever come or ever been expected to come by its own power. The picture shows a part of this town, with its galvanized iron covered buildings, and one of the local means of conveyance, an ox team.

By the time a hotel was reached, men, women and children had surged around the car until it was almost impossible for Mrs. Skiles and myself to get out. The children begged to sit in it, the men and women alike pulled at the lamps, the horn, or anything that looked detachable, and one curiously inclined fellow stuck his knife through a tire to see if it were solid—and that, after all those 850 miles without a puncture!

With the aid of the police a safe storage room was found where the car was left until we were ready for the return trip, three weeks later. By that time the country was so dry that the South River hill was climbed without difficulty, and with the exception of an exciting night ride through a bush fire our experiences were very much the same as in the drive north. The time, however, was shortened, requiring only four days for the return trip. The indistinctness of the picture in the heading was caused by the intense smoke from the forest fires which pervaded the whole of Northern Canada during August and September.

The courtesy with which the Canadian people treat the motorist makes traveling in their country especially delightful. Indeed, the price of gasoline, ranging from 25 to 30 cents, and the poor hotel accommodations are all one could possibly find fault with, but the latter difficulty can be overcome by carrying a cooking outfit, and preparing one's own meals.

This may not appeal to the reader as a pleasure trip, but it was to us, and certainly one full of rich experiences, besides being a genuine test for the car. Among the humorous experiences was one we had near Bracebridge, Ont., where we came very near breaking up a funeral. In fact, we came close to causing another, as one man, attempting to pass our machine, was thrown from no less than three different buggies in which he tried to ride by.

PANHARD OIL MADE AND SOLD BY G. A. HAWS.

Panhard Oil has become familiar to all automobilists through its American manufacture and marketing by George A. Haws, 73 Pine street, New York City. This manufacturer of lubricating oils and greases will have an exhibit in the Madison Square Garden show, where will be shown the various grades of Panhard oil, light, medium and heavy, and also Panhard greases for various uses.

Through an unfortunate error in the January 7 story of the Grand Central Palace show another concern was mistakenly given credit for Panhard oil success in America. A suit is now pending against a New York concern for placing an oil on the market called Panhard. All the evidence is in and a decision will probably follow in the next fortnight or so.

PLANS POR THE SHOW OF THE SOUTHWEST.

St. Louis, Jan. 11.—The best and largest automobile show ever given in St. Louis will be held February 15 to 20 in the new Coliseum, under the direction of the St. Louis Automobile Manufacturers' and Dealers' Association. The building, which is very large, could not be better arranged for this purpose. It will permit of an artistic and convenient placing of exhibits, and in a manner which will make all spaces very desirable.

The manufacturers will do well to bear in mind that this show will mean much to them, for the reason that St. Louis and the Southwest offer an excellent market at present.

A. L. A. M. DECLARES A DIVIDEND.

At the A.L.A.M. meeting, held January 7 at the New York City offices, it was decided to pay a dividend of $50,000 from the reserve fund of the association.

The last formality finally affecting the severance of the membership relations of the Olds Motor Works was carried out.

Col. Charles Clifton, the presiding officer, gave a talk on affairs on the other side, making it apparent that the foreign makers are feeling the effects of their inability to compete in the American market as in the past.

L. H. Kittredge, another recent foreign visitor, told of the wearing out of the French roads owing to the heavy automobile traffic. He also said that high-powered cars predominate in England, whereas in France low-powered machines are now the more numerous.

H. B. Joy, chairman of the Automobile Manufacturers' Tariff Committee, reported on the brief recently submitted to the Ways and Means Committee of the lower house of Congress. The document will be generously distributed throughout the country, for the facts therein contained are of general interest.

Present at the session were the following: Elmer Apperson, Apperson Bros. Auto Co.; John S. Clarke, Autocar Co.; W. C. Durant, Buick Motor Co.; W. C. Leland, Cadillac Motor Car Co.; H. Chalmers and R. D. Chapin, Chalmers-Detroit Motor Co.; M. S. Hart, Corbin Motor Vehicle Corp.; J. H. Becker, Elmore Mfg. Co.; W. E. Metzger, Everitt-Metzger-Flanders Co.; H. H. Franklin and G. H. Stilwell, H. H. Franklin Mfg. Co.; E. W. Headington, Haynes Auto Co.; A. N. Mayor, Knox Auto Co.; S. T. Davis, Jr., Locomobile Co. of America; H. A. Lozier, Lozier Motor Co.; H. B. Joy and M. J. Budlong, Packard Motor Car Co.; L. H. Kittredge, Peerless Motor Car Co.; Charles Clifton, The George N. Pierce Co.; George Pope, Pope Motor Car Co.; George J. Dunham, Royal Tourist Car Co.; G. E. Mitchell, Alden Sampson Mfg. Co.; R. H. Salmons, Selden Motor Vehicle Co.; Roy F. York, F. B. Stearns Co.; I. H. Page and C. C. Hildebrand, Stevens-Duryea Co.; L. J. Hart, Waltham Mfg. Co.; Thos. Henderson, Winton Motor Carriage Co.

COIL MAKERS COMBINE TO FIGHT PATENT.

The Allied Coil Manufacturers' Association is the title of a new organization that came into being as the result of a meeting held at the Prince George Hotel, New York City, by a number of representative coil manufacturers who were exhibiting at the recent Palace show. The officers are:

President, Frank Brandow, of the Jacobson-Brandow Company, Pittsfield, Mass.; vice-president, C. P. Byrne, of the Kokomo Electric Company, Kokomo, Ind.; treasurer and secretary, John O. Heinze, Heinze Electric Company, Lowell, Mass. The executive committee of the association is composel of the foregoing officers in addition to the following: Charles F. Splitdorf, Splitdorf Laboratory; F. A. Wood, National Coil Company, Lansing, Mich., and W. P. Wood, Pittsfield Spark Coil Company, Dalton, Mass.

The object of the organization is to defend the rights of its various members to manufacture, use and sell interchangeable unit spark coils, combining in order to reduce the burden of legal expense. The interchangeable unit coil as now generally used is covered by a number of patents, that involving the basis of unit construction being claimed as basic by its owners. It is this point in particular that American coil manufacturers dispute, their claim being that such patents only cover specific details and are not in any sense basic.

Those present at the meeting and the companies they represent follow: A. H. Stroud, Chicago Coil Company, Chicago, Ill.; C. P. L. Noxon, Syracuse, N. Y.; C. P. Byrne, Kokomo Electric Company, Kokomo, Ind.; C. F. Splitdorf, Walton avenue, New York: F. A. Wood, National Coil Company, Lansing, Mich.; W. P. Wood, Pittsfield Spark Coil Company, Dalton, Mass.; George Parker, American Coil Company, Foxboro, Mass.; H. G. Mears, New York Coil Company, 338 Pearl street, New York, and E. J. Huber, Duplex Coil Company, Fond du Lac, Wis.

GIVE YOUR CAR THE CARE IT NEEDS

By CHARLES D. SMITH.

WHO is to blame—is it you, Mr. Manufacturer, or is it you, Mr. Owner? To blame for what, Mr. Owner? For "knocking," refusal to pay repair bills, incessant fault-finding with the man who looks after your best interests (whether he be a brass polisher, floor man, garage or repair shop foreman or superintendent), for literally tearing to pieces Mr. Manufacturer's advertising, selling, repairing and manufacturing policies? If you do any of these things, Mr. Owner, you are to blame. You immediately cry, "Why! Am I not the aggrieved party?" Let us see if you are.

Incompetent Owners.

First, are you a "knocker"? You have always been a broker, baker or candlestick-maker—anything but a mechanical man. You buy a car, have a few minutes' or a few hours' instruction in the method of operating it and the adjustment of a few of the most important parts. But it is safe to say that, with your limited knowledge of anything mechanical, and the hundred and one new features coming to you suddenly, you have forgotten nine out of ten of the things you were told, even before you have driven your car one mile. Then some little thing (very trivial to the expert) goes wrong. You say, "It's the machine." Sure, it was the machine; perhaps the fault of the manufacturer, and perhaps the way you have cared for the machine. But you, Mr. Owner, ninety-nine times out of a hundred, will go back to the repair man and swear by blue streaks (and sometimes blue cuss words) that the machine has never been right since you had it and that you are entitled to a new one.

Mr. Dealer or Mr. Repairman listens to these kicks, but does he swear back? Seldom (audibly). He has expected this from you; he has had it from 95 per cent. of his customers before you, during their first few weeks' experience with their first car. You are so mad you will hardly let him explain to you that he had already cautioned you, for example, against the coming of cold weather; that your carbureter might need slight change in its adjustment; that you should use some kind of anti-freeze solution in your water circulating system a little before you expected freezing weather. You have forgotten he told you to oil certain joints or connections in this or that place; and that you should always keep your tires pumped up.

Have you, Mr. Owner, ever neglected any of these different things, or maybe all of them, and taken it out of some one's hide for your indiscretions? Be frank with yourselves, you owners of automobiles—'fess up; most of you have.

Have you been fair to the manufacturer? No, you have taken out your hammers and pounded him to a mass of jelly. Why? Because you are not fair with him or with yourselves. You, perchance, did not want it known that you were not proficient in taking care of your machine.

Results of Unfair "Knocking."

What have you done? Gone to your club, to your business, among friends and acquaintances, and told them what a bum car you have. The result is that the dealers and manufacturers, who are really your good friends, lose not only your business, but that of whomever you may have influenced against your particular make of car.

But suppose now, Mr. Owner, you are a man who can be convinced; that you have brought your car in, and Mr. Dealer or Repairman has convinced you that the trouble you have is your fault, what then? This may be the tenth time you have had this same trouble, and the dealer may feel it is time he began to make charges for time or parts. You refuse to pay the bill; say the trouble should not have happened; that: "My car has been run only one month, two or three months" (as the case may be), "and is practically, if not quite, a new car. Why should I pay? I am being 'done.'" But you do not stop to consider that you are presented with such bills because you have forgotten, or because you did not know. If so, why should Mr. Dealer or Mr. Repairman be held up for bills you justly owe?

Think this over, Mr. Owner. You may have had this charge made against you the fifth or tenth time you came in for your repairs (true, only slight, but they cost Mr. Dealer and Mr. Manufacturer something). But, Mr. Owner, did they charge you the first four times in one case, or the first nine times in another? Be honest now—have they not been very good to you—and in all justice should you not walk up to the desk and pay your bills? You owe it honestly; so be fair with the other fellow, and do not get out your hammer and start an anvil chorus, telling Mr. Dealer or Mr. Manufacturer that if he wants his money he can sue for it. Pay up, old man; they can't keep your car in shape indefinitely, with no charges being made against you.

Abuse of Machines.

By this time, Mr. Owner, you are thinking: "This does not mean me. My trouble was that I had a spring break while I was driving along a smooth boulevard." Of course, you did; but do you remember that, several days before, you drove over some very rough country roads, or ran your front wheel into a bad hole in the street? That was when your spring started to go; the weight of the car was too great for the remaining uninjured spring leaves, and the spring finally let go while you were driving on a good road. You may have your car overloaded to-day, or have had since the trouble started, but now is the time Mr. Manufacturer "gets his," because the spring gave out on a smooth street. You did not think of your overloaded car, or the bad roads, or the ride of the other day, did you, Mr. Owner? No. Well, don't lay it up against any one but yourself.

Tests by Manufacturers.

You say it was not a spring. It was a front axle. The same ride that broke the other fellow's spring may have been the cause of your broken axle. Don't kick too hard, Mr. Owner. The manufacturer has driven the first one, two and often three cars made, of this same model, many thousand miles, under conditions that at times were beyond reason. The axles on these cars did not bend. They had also been well tested.

Tinkeritis.

So I might go on down the line, and let me tell you right here, Mr. Owner, ninety-nine times out of a hundred, you are to blame. You have come back with the statement that you are a mechanical man; that you have had several cars and are experienced. Quite right. But do you have trouble? Yes? Well, perhaps you are troubled with "tinkeritis." It happens in nearly as many cases that an owner is troubled with this disease as that he does not know. A great many people are overzealous in attention to their machine. Let me tell you that the man with the "tinkeritis" habit is the hardest to deal with the auto man comes in contact with. Usually he *knows*. He does not give the repairman or the manufacturer or any of his experts the credit of being as well acquainted with machines as he himself.

What the American Maker Has Done.

Did you ever stop to think that the first American automobile was sold in 1898—less than eleven years ago? Do you remember what a crude looking machine it was? Not much like the present-day luxurious car. Was it you, Mr. Faultfinder, Mr. Knocker, or Mr. Tinkeritis, who brought about this wonderful change? No, it was the manufacturer and the men whom you have kicked against.

Let me tell you there are not twenty automobile manufacturers who have made a large amount of money, and they only from the fact of having done an enormous business. The successful manufacturer's profits have been no more per piece than the

manufacturer who has barely kept his nose above water, but the former had the advantage of a large business. Why, then, should he charge less for his parts, if this is so. The amount of money lost by special machine tools, jigs and fixtures becoming obsolete is almost unbelievable.

Extensive Experimentation by Manufacturers.

Is the disgruntled man who is always saying that this or that manufacturer does not know his business, does not know how to build an automobile because he did not put such and such a mechanism on his latest model, and who always the the proper solution for making such models better, aware that the manufacturer against whom he is kicking, for not having these certain devices, was in the majority of cases the first maker to use the device he is howling about; that the manufacturer tried it long ago and found it inferior, a detriment rather than the valuable asset you believe it? Are you aware that the older and larger manufacturers have expensive experimental rooms and laboratories to keep up, and that they are continually building motors and cars that are never put on the market; that they are building new devices of all descriptions, hoping to get some strong feature that will be of immense service to you in your pleasure? In these laboratories dozens of coils, magnetos, timers, carbureters and other accessories are tried, not for an hour or a day, but for months. All this is done, Mr. Owner, that you may have the enjoyment that comes of a first-class car; and the manufacturer is giving you just what you are looking for—a first-class car. In fact, he is giving you a mechanical production that is far superior to anything that is a means of locomotion.

Mechanical Status and Burden of the Automobile.

Remember that your automobile travels under the vilest conditions, is handled brutally at times, yet gives you continually dollar for dollar in value, if it is handled and cared for with a reasonable amount of intelligence. The manufacturer is entitled to the credit of giving you a good, high-class automobile; and he has done it in less than eleven years.

Take the next best in locomotion—the locomotive. Have we built up in seventy-five years a locomotive that can compare with this eleven-year old child? No. How many of you have boasted that you have taken your beloved wives, children and friends on trips from one to four thousand miles and never touched a wrench to your car from the time you started until you returned? Could you ride behind a locomotive, of which most of us are proud, without a wrench being used on it in a like number of miles? I guess not.

Incompetent Chauffeurs.

Let me caution the man who hires a low-salaried chauffeur. The cheap man is the curse of the industry. The manufacturer pays big wages to turn out a high-class finished product. Why, then (if you must have a driver), do you hire a cheap man to destroy the machine of excellence? You may rest assured that if this man whom you are paying low wages is a valuable man he would be getting the top-notch wage. He would go after it, as any other man would reach out for the best. You may believe you are saving money with your cheap man. But let me tell you he is taking the life out of your car very rapidly, and the money from your coffers more rapidly still. Stop going around to your dealer or manufacturer, telling them your troubles; that they should make good this or that thing on your car. It is not their fault; you are to blame; you have a cheap man on your car.

The Local Expert and Factory Work.

We know the man who writes to the factory: "Your repairs were received and were not right. We have the best automobile expert in the State in our town, and he says this and that part is wrong," etc." Ought he to be the arbiter, Mr. Owner? He may look after or be familiar with from five to twenty-five different makes of cars. Can he be proficient on all of them? Well, hardly; maybe on none of them. The manufacturer, on the other hand, has his men trained for one make of machine, of his manufacture. You may be very sure that when your repairs come back to you they are about right. The men in the factory repair department are not men who are here to-day and somewhere else to-morrow. They are usually men of some years' standing with their company; not only that, but they usually know their business.

Who's to Blame.

Now, Mr. Manufacturer, are you to blame? I really believe that you seldom are. You know that Mr. Knocker is wrong, because you have the names of hundreds of customers who are driving with the best results the same type machine that is complained of. Perhaps the satisfied users have had more trouble than Mr. Knocker, only they know what a machine should do.

Garage and Factory Complaints.

You, too, Mr. Faultfinder, when you go to a garage, do not try to have the men get your car out ahead of the four or five other customers waiting for theirs. They are just as important as you. Do not stamp around and make every one feel unpleasant, as no one is to blame because you came in a little later than some one else and have a wait a few minutes.

Let me say that when you, Mr. Owner (who may be the big noise in your locality), write to the manufacturer and ask him to send you a bill of goods, don't kick if they come to you C. O. D. The manufacturer has probably never heard of you.

An Ordinary Business Proposition.

Now, Mr. Owner, look the situation squarely in the face, size it up like any other business proposition, take into consideration that the automobile industry to date has produced less than twenty money-makers; that you have the best means of locomotion in the world, and you will see that the automobile manufacturer is not a grafter, all all, but a business man who is using every means at his command, from the smallest item up, whether it be his garage, manufacturing, repairing or selling departments, for your pleasure, as your pleasure means his business. You are the gainer, Mr. Owner, so why not be fair with the manufacturer? The manufacturer is not working a ten-cent game with a dollar come-back; he is giving value for every dollar received—a dollar value for every dollar you spend. So be fair with him. Learn to care for your car properly and it will then give you satisfaction.

TOLEDO DEALERS HAVE ORGANIZED.

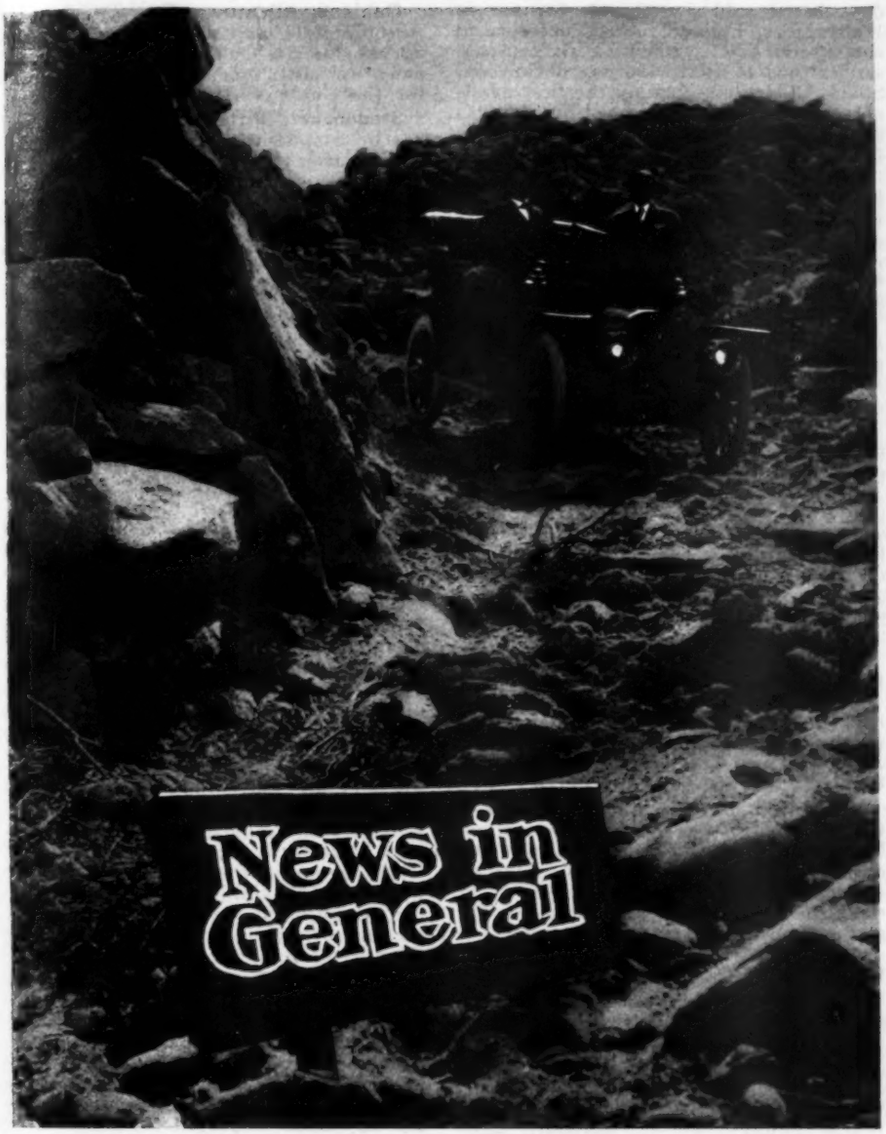
Toledo, O., Jan. 4.—Toledo automobile dealers are desirous of closer co-operation, and with this in view the Toledo Automobile Dealers' Association will shortly be incorporated, formal application having already been made. Sixteen local dealers have already subscribed the corporate stock, and practically every dealer has signified his willingness to unite in the organization.

Incorporators are: A. A. Atwood, W. H. McIntyre, E. A. Kirk, S. C. Fisk, J. G. Swindeman, A. W. Morris and B. O. Gamble. While the officers have not been chosen as yet, they will probably be: President, A. A. Atwood; vice-president, W. H. McIntyre; secretary, S. C. Fisk, and treasurer, E. A. Kirk, as this selection has been endorsed by the majority.

The organization of this association insures Toledo the largest and best automobile show she has ever had.

JAIL SENTENCE FOR GRAFTING JUSTICE.

Camden, N. J., Jan. 11.—Conrad Waldvogel, justice of the peace of Ancora, a small place near here, was sentenced to three months' imprisonment by Judge Joline to-day, on the charge of retaining for his personal use about $120 which he had collected from automobile owners for alleged violations of the speed laws. Waldvogel was arrested about a month ago, when it was discovered that fines amounting to $30 had not been turned over to the State, but because of his age and the fact that he is a Civil War veteran sentence was suspended. Later it became known that the amount involved was much greater than at first supposed, and he was rearrested, the case coming up for trial to-day.



A Typical Southern California Tour.

Franklin touring car going through Devil's Canyon in the southern part of California. Never before had a car on its own power taken this trip from San Diego, through the canyon, across a desert waste, and into the Imperial Valley and back again. The trip was taken by H. M. Willard, T. E. Patterson, and Wilson S. Smith, two of whom appear in the picture. The other is handling the camera.

Adirondacks Livery Service for Lozier.—The field of the automobile is being extended every day and in every direction. Some of these up-to-date extensions are surprising and some are more—startling, in fact. Very few visitors to Lake Placid in the Adirondacks ever expected to see the passing of the well-known buckboards, yet this is almost an established fact. Three years ago, when E. R. Lozier took a touring car up in the Adirondacks, the Summer visitors and residents of that locality considered the matter in the nature of a joke, as it was thought impossible to use an automobile in that section. In order to settle all doubts on this question, one of the first stunts undertaken was an excursion over one of the worst roads with eighteen of the youngsters from the Stevens House for a fifty-mile trip through the mountains. George Stevens, of the Stevens House, was so impressed that he ordered a duplicate car for his own use, and since that time the guests of the hotel have insisted upon renting this car for trips to the various points of interest, so that he has been unable to use the car for his own purpose. Now he will establish a rental agency and has just purchased two large seven-passenger Lozier cars for use the coming season.

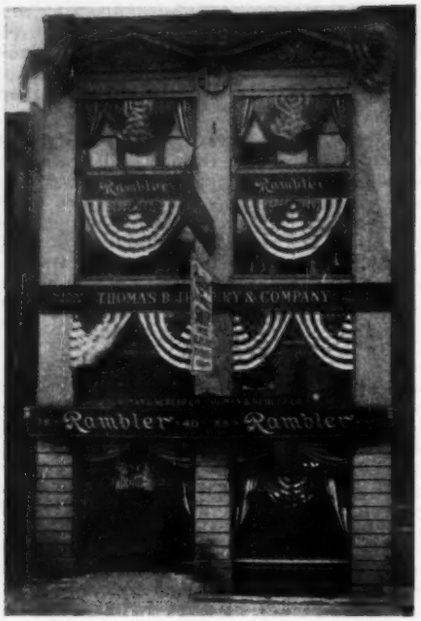
Another European Invasion.—Negotiations for the purchase of three Mitchell cars, recently concluded, brought to light the fact that these were intended for a new and unique tour of Europe the coming Summer. This deal was put through by Victor Moore on the basis of a special delivery date. As planned by Mr. Moore, the touring party will include Mrs. Moore, Mr. and Mrs. George M. Cohan, Mr. and Mrs. Sam H. Harris, Mr. and Mrs. George W. Lederer and William Pinkerton. The automobiles will be shipped directly from the Racine factory to Paris, where a complement of expert chauffeurs who know all the prominent touring routes in France, Germany, Italy and other portions of the continent will be engaged. The Moore party will leave New York on the Lusitania about the middle of May and the continental start will be made from Paris about June 10. The limousine will be included in the appointments of this unique automobile train as a precaution against emergencies in districts that lack café accommodations, Shero, the Japanese servant of Mr. Moore, having signed to do the cooking.

Gabriel Will Invade Europe.—Owing to the fact that exhibitors of sundries will not make exhibits throughout the various shows in the United States after the National shows, it will be impossible for the Gabriel Horn Manufacturing Company of Cleveland to exhibit its immense instrument, containing 37 horns, and playing a full 3½ octaves. For this reason Mr. Foster has been deluged with offers from various promoters for the use of the horn with M. Lusk, the musical expert, as the operator. He has already made arrangements with Rochester, Kansas City and several other cities, and this big horn will be steadily employed from now until the close of the show season. At the conclusion of the season it is the intention of Mr. Foster to take the big horn to Europe, there to tour through England, France, Germany, Switzerland and Italy, in all of which countries the horn is very popular. Mr. Foster received from the Paris show alone orders for 550 horns, and recently filled an order for several thousand in London.

Says R. E. Olds: "Rarely does an automobilist realize the tremendous amount of painstaking detail that enters into the average automobile. I venture to say that very few owners of automobiles could guess within a thousand pieces that enter into their cars. By our systematic division of building and assembling the multitude of parts in every Reo we can instantly trace any defective part to the man at fault. Knowledge of this fact on the part of every mechanic whom we employ places him on his individual responsibility. This is true with every man from the foundry to the assembling department; to the testing tracks and trestles and finally to the experienced shipping crew whose duty it is to see that every car is properly blocked and crated before delivery is made to the transportation companies. This, in a measure, explains why every Reo car unloaded at its destination can be started with a half turn of the crankshaft and immediately run under its own power."

Body Builders Prosperous. — The Bridgeport Vehicle Company, one of the largest of the fine coach builders, which made Bridgeport, Conn., famous for this kind of work, has recently turned its attention to the construction of automobile bodies. So successful has it been in this line that the plant at Water street and South avenue has been outgrown. To provide for present and future needs ground has been broken at Fairfield and Holland avenues for a three-story brick building 88 by 160. This handsome structure is expected to be completed, ready for occupancy, July 1, when it is expected that the present force of seventy men will be doubled. The officers of the company, with a showroom for the displaying of six cars, will be in the Fairfield avenue side of the building. The concern will install its own power plant and an elevator. The officers of the company are: President and treasurer, Harry D. Miller; vice-president, H. F. Brandes; secretary, George C. Miller.

Growth of the Jackson.—President G. A. Matthews, of the Jackson Automobile Company, in speaking of the coming year, said: "During the last year we have erected and moved into one of the finest plants in the West. The new fac-



Rambler New York Branch.

The New York branch of Thomas B. Jeffery & Co. is located at 38-40 West Sixty-Second street, where the entire line of 1909 Ramblers are on exhibition and serve as a special attraction during the Garden show, the same as was the case during the Palace show. This company believes in having an exclusive show, and it would appear from the results claimed that it is a most satisfactory plan.

tory is located at Jackson, Mich. It utilizes 210,000 square feet of floor space, made up of a four-story building, 600x50 feet; a two-story building, 300x100 feet, and a drop forge shop of 30,000 square feet. The Jackson output this season will be 3,500 cars. The first of the 1909 cars appeared in September and 400 of them have already been shipped to agents. Present production is eighty-five per day, which early in the new year will be raised to 100. In the neighborhood of 1,500 men are employed, who work also four nights a week. We make practically the entire car, forgings, engine, bodies and wheels being manufactured at our big plant in Jackson."

A Continental Luncheon.—During the Grand Central Palace show one of the family trade luncheons was that of the Continental Caoutchouc Company, held in the Indian room at the Hotel Astor. Of course, there was a good deal of discussion of Continental tires and demountable rims, and the representatives and sales force expressed themselves interestingly and thoroughly, the summing up being of general all-around good. Joe M. Gilbert, the general manager, was the toastmaster of the occasion, the others present being the following: P. O. Eckhardt, J. H. Sheldon, S. S. Poor, J. B. Cothran, B. D. Hart, James L. Gibney, John Gibney, A. L. Risley, E. E. McMaster, James Patterson, E. L. Thompson, W. A. Wattenschedit, F. C. Robie, H. W. Lester and Messrs. Gray and Eccleston.

Motor 'Bus for Arctic Circle.—When a motor truck company can sell its goods on the same day to representatives of two different countries, where climatic conditions and the roads are radically different, it is a good demonstration of the fact that the general utility of the commercial vehicle has been proven beyond a doubt," said Morris Grabowsky, of the Rapid Motor Vehicle Company, of Pontiac, Mich. "On the same day that I sold five Rapids for use in Helsingfors, Finland, ninety miles from the Arctic Circle, I sold a sixteen-passenger 'bus to Rietz Horns, of Coronia, Spain. This 'bus goes by the first available boat and will be used in the extremely mountainous sections of the country."

Champion Cyclist Becomes an Autoist.—Frank L. Kramer, of East Orange, for the past eight years the champion cyclist of America, has become an autoist. During the recent Palace show he bought for immediate delivery a 1909 $2,000 40-horsepower Jackson runabout. The car will be Jackson green, upholstered in pigskin leather, and it is possible that the cycle champion may want to try his hand in various automobile contests.

Used the 1908 Maxwell-Briscoe.—In the advertisement of the Maxwell-Briscoe Motor Company which appeared in THE AUTOMOBILE of January 7 an illustration of a 1908 Maxwell model car was used in error in place of the model of the present year. The 1909 Model DA is fitted with a magneto, gas headlights and a generator as part of its regular equipment, which means a very substantial difference to the purchaser of a car.

A Continental Announcement.—The Continental Caoutchouc Co., 1788-90 Broadway, New York City, announces that all Honover interests formerly held in their company have been purchases, and hereafter Continental material will be marketed by American interests only.

Correction in Cameron Advertising.—On page 98 of the advertising section, December 24 issue, a typographical error gave the price of the Model 16 Cameron touring car as $1,000, when in reality at the correct price of $1,100 the makers are giving unusual value for the money.

IN AND ABOUT THE AGENCIES.

Franklin.—The H. H. Franklin Mfg. Company has appointed the following agents for the coming season: Trenton, N. J., Munro & Engle; Sharon, Pa., Fruit-Ohl Company; York, Pa., J. W. Richley; Charleston, W. Va., Charles E. Ward; Youngstown, O., Standard Auto Garage Company; South Bend, Ind., Otis Motor Car Company; Seattle, Wash., Seattle Automobile Company; San Antonio, Texas, Mark V. Haley; Beeville, Texas, Beeville Automobile Company; Shawnee, Okla., T. F. Bruber & Company; Shreveport, La., L. W. Huckins; Savannah, Ga., T. A. Bryson; Cocoa, Fla., S. F. Travis & Company.

San Francisco.—A number of automobile agencies have leased the property on Van Ness avenue, between Birch avenue and Fulton street, and will erect a one-story brick building to be used as a garage. Among the companies interested in the scheme are the Maxwell agency, the Mobile Carriage Company, the Pierce-Arrow agency, the Pacific Taxicab Company and the Continental Tire Company. The building is to be ready for occupancy early in March.

Western Agents Expand.—J. W. Leavitt & Company has leased for a term of years the large lot at Golden Gate avenue and Hyde street, San Francisco, and will erect a new building. This company is the agent for the Reo, Stoddard-Dayton and other well-known cars.

Rambler, Cleveland.—Thomas B. Jeffery & Company have opened a branch in Cleveland at 2558 East Ninth street in the quarters formerly occupied by the T. C. Whitcomb Automobile Company.

Oakland, Allentown, Pa.—The Lawfer Automobile Company has secured the agency for the Oakland car. This company was also recently appointed agent for the Chalmers-Detroit.

Studebaker, Pittsburg.—B. F. Benson has been appointed agent for the Studebaker car in Western Pennsylvania and will erect a garage on Craig street, near Luna Park.

Pope-Hartford, Kansas City, Mo.—H. Holzhauer has been appointed agent for the Pope car and will open headquarters on Grand avenue.

Knox, Philadelphia.—The North Philadelphia Auto Station at 3425 North Broad street has taken the agency for the Knox.

American Locomotive, Des Moines, Ia.—The agency for the American Locomotive has been taken by Grover Hubbell.

Jewell, Kansas City, Mo.—The Rhodes Implement Company has taken the agency for the Jewell line.

PERSONAL TRADE MENTION.

Carlton R. Mabley, one of the pioneers in the automobile industry, long and prominently identified with the importation of Panhard, Renault, Mercedes and other automobiles of note, during the palmy days when the firm of Smith & Mabley was a power in the trade, and the instigator in the organization of the Smith & Mabley Mfg. Company, now the Simplex Automobile Company, will take the general management of the Post Motor Company, 1620 Broadway, New York City, which will have the New York agency of the Hart-Kraft delivery wagons. Mr. Mabley was prominent in the exhibition at the Grand Central Palace, just brought to a successful termination.

Henry Souther.—Announcement is made that Henry Souther, the well-known engineer, has been secured by the Standard Roller Bearing Company, Philadelphia, to devote a large part of his time to its interests as consulting engineer. Mr. Souther's services have recently been employed to some extent by this company in this direction, and the above arrangement is the outcome of the results obtained in the betterment of its product.

Charles Schmidt, when interviewed recently regarding the report that he was to sever his connection with the Peerless Motor Car Company, said: "The last contract has several years still to run, and I feel no differently in the matter than at the time of signing it. My relations with this firm have always been of a very satisfactory nature, and I have no present or future intention of terminating this connection."

E. R. Thomas, of the E. R. Thomas Motor Company, Buffalo, accompanied by Mrs. Thomas and their daughter, last week sailed for an extended European trip. Mr. Thomas said before sailing that it was the first vacation he had had in many years, but he went away with the comfortable feeling that the industry was assured of the most satisfactory season since its beginning.

Alfred Reeves, general manager of the A. M. C. M. A., this week is enjoying a well-earned rest at Atlantic City, whither he and F. J. Wagner went on Saturday last accompanied by their families. L. M. Bradley, the general manager's assistant, is visiting his old home in Worcester, Mass.

William F. Legg, a graduate of Cornell University and formerly with the E. R. Thomas Motor Car Company, Thomas B. Jeffery Company and the St. Louis Car Company, has taken charge of the factory of the Carter Motor Car Corporation at Hyattsville, Ind., as superintendent.

Added to the E-M-F.—Two more "leads" and one understudy have been added to the E-M-F organization. These are James Heaslet, whose title is chief engineer, and Harry L. Cunningham, who has assumed management of the E-M-F company's Detroit retail branch.

Archie McLachlan, who has been in charge of the Chicago branch of the Royal Tourist Company for the past six months, is to return to Cleveland, where he will take up his former duties as sales manager of the Royal Tourist Company.

W. W. Partridge, formerly at the Stearns factory, has joined the sales force of the Tebean Motor Car Company, which has the Kansas City agency for the Stearns car.

SOME BUSINESS CHANGES.

Powell Supply Company, Omaha, Neb.—This is the new name since January 1 of the former Powell Automobile Company of Omaha, Neb. On that date, also, they removed from 2010 Farnam street to 2020-2022 Farnam street, where they will have about three times the floor space previously available. The change in name was made because it was a misnomer, the company never having handled cars, but devoted itself to supplies exclusively.

Utility Company, New York City.—The Utility Company, 636 West Forty-fourth street, New York City, manufacturers of the "U K O" mica spark plug, have taken over the business and goodwill of the spark plug department of the Richardson Engineering Co., Hartford. Its plug was called the "Rich-Spark" and followed the "U K O" closely in general design.

Cameron Sales Company, Beverly, Mass.—The general sales offices of the Cameron Car Company of Beverly, Mass., manufacturers of the well-known air-cooled cars, have been taken over by the recently organized selling agents, the Cameron Motor Company, of New York. All correspondence relative to sales should be addressed to the offices at 231 West Fifty-fourth street, New York City.

Top Companies Consolidate.—The L. L. Lamen Auto Top Company and the Iroquois Auto Top Company, of Utica, N. Y., have consolidated and in the future will do business under the latter name.

BUSINESS TROUBLES.

New York City.—A petition in bankruptcy has been filed against the Automobile Coaching Company, of 147 Spring street, in which it was alleged that they made an assignment on December 1 and transferred $3,000 worth of assets. This petition was filed by Louis Ginsberg as administrator of the estate of David Ginsberg on a claim of $2,361 judgment obtained May 22, 1908, for the death of David Ginsberg. Schedules in the assignment filed recently show liabilities of $13,531, nominal assets of $80, and actual assets of $24.

NEWS OF THE GARAGES.

Bridgeport, Conn.—It is announced that the garage and agency business of the Blue Ribbon Auto and Carriage Company has passed into the hands of a new company, and will hereafter be known as the Blue Ribbon Garage. The latter will continue the agencies maintained by the former, which include the Packard, Cadillac and Franklin cars.

Hartford, Conn.—R. D. & C. O. Britton, local representatives of the Maxwell and the Stoddard-Dayton, have practically completed their remodeled garage on Allyn street and are now moving in. The concern will now be in a position to care for the increasing trade. The outlook for both cars is very good.

New York City.—The Riverside Garage Company announce the opening of a new garage at 202 West One Hundred and First street, New York City. The building is new and absolutely fireproof, with floor space for 200 cars.

Hutchison, Kan.—This town is to have a new and up-to-date garage. The Taylor Motor Car Company has leased the new structure at 29-31 East Sherman avenue, which is to be 50x150 feet.

Prady, Tex.—Sheridan & Wade, who are starting in the automobile business, have leased a large lot near the post-office and will erect a garage.

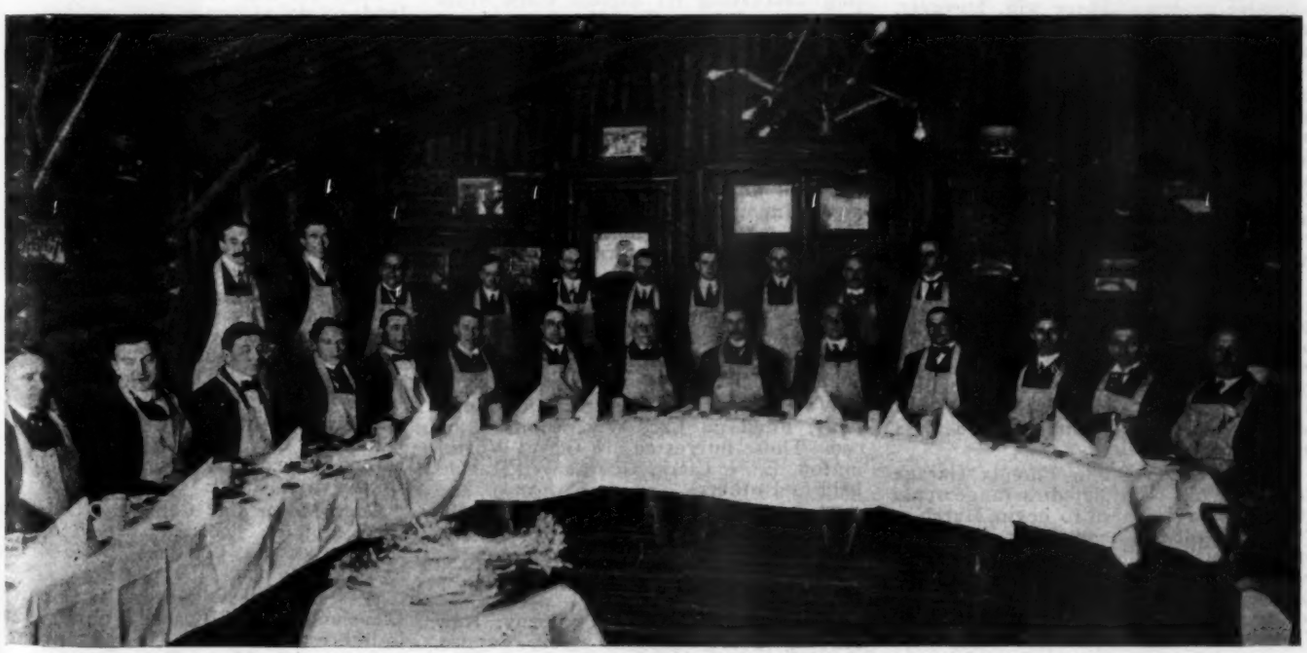
Philadelphia.—W. H. Schofield & Son has opened the New Camac Garage at 250 South Camac street.

JONES SPEEDOMETER DINNER.

Saturday night, January 9, the New York representatives of the Jones Speedometer Company gave a beefsteak dinner in Healey's "Log Cabin," at Broadway and Sixty-sixth streets, to a few friends and out-of-town Jones agents who were in the city. All discussion of a business nature was tabooed, the occasion being simply a social gathering, with everyone doing full justice to the ample layout provided.

The list of guests included Gaston Plantiff, manager of the New York branch of the Ford Motor Company; Col. K. C. Pardee, of the Maxwell-Briscoe Company; G. A. Wahlgreen, Denver; C. O. Sacks, president Rowland Advertising Company; J. A. Clark, Peerless Motor Car Company; E. B. Jackson, of the Packard Motor Car Company, and Harvey Adams, of the Auto Supply Company. Among the Jones representatives were General Manager G. L. Holmes and Sales Manager E. P. Nussbaum, of the New York branch; F. G. Dwight, manager of the Philadelphia branch, and R. C. Peet, Western representative.

The others present were: F. H. McFarland, W. J. Turp, A. C. Nichols, A. W. Owen, W. C. Boome, Thomas Boome, C. A. Kline, P. S. Barrett, Mr. Steckle and A. C. Howell, whose introductions of the speakers were a feature of the function.



Jones Speedometer Representatives and Friends Enjoying Beefsteak Dinner at Healy's "Log Cabin," New York City.

TAXICAB AND TRANSIT.

New Cab Service.—It is said that a prominent automobile manufacturer is backing the project to start a taxicab service over the Queensboro Bridge, New York City, as soon as it is open to traffic. It is likely that it will be a year or more after the opening of the bridge before the trolleys are running, and an auto service would prove very profitable as well as convenient. The New York and Queens County Railroad is willing to allow the service.

Wyandotte, Mich.—Edwin A. George and G. W. Blake, both of this city, are the backers of an auto express service which is to be maintained between Detroit and western suburban points, including River Rouge, Delray, Wyandotte, Trenton and other adjacent territory. A number of Grabowsky power wagons are to be used, and a central collecting station is to be maintained in Detroit. The service will probably start February 1.

Four Wheel Drive Auto for Duluth.—The Four Traction Auto Company of Mankato, Minn., has received the contract for a police patrol to be delivered to the city of Duluth. This product has a three-speed transmission, which delivers power to all four wheels, which superior traction will be necessary on the city's bad hills. The body will be equipped with an ambulance outfit comprising stretcher and Red Cross outfit.

Schenectady, N. Y.—The Winter schedule of the P. R. & S. Transportation Company has been discontinued and will not be resumed until suitable Winter tops can be secured for the machines. Specifications are now being prepared for regular Winter cars, and it is also the intention of the company to put on three new cars in the Spring. It is likely, also, that lines will be started to South Schenectady and Burnt Hills.

Pittsburg, Pa.—J. L. Shearer, Jr., of Harrisburg, who was one of the prime movers in the organization of the taxicab service there, is interested in the formation of a similar concern here. Application for a broad charter will be made, and the city will be covered by an extensive system. There will, however, be no connection between the two companies.

Asbury Park, N. J.—A taxicab company is being organized here to maintain an all-the-year-round service at the leading hotels. Among those interested in the company, which has a $25,000 capitalization, are Michael E. Sexton, Milan Ross, Dr. T. H. Pratt, and others. In the Winter time a central station service will take the place of the more numerous Summer stands.

Los Angeles, Cal.—F. M. Hoblitt, who is representing the American Berliet Locomotive Company, is looking over the local field with the intention of running an automobile freight line from this city to Wilmington, Cal. A regular schedule is to be maintained and a company will be organized to look after the business at this end of the line.

Lexington, Ky.—The Phœnix Garage Company has completed arrangements for a cab service here to begin March 1. These cabs have been ordered by the company, who will have their headquarters in the Phœnix Hotel Building. The fares charged and taxameters used will be the same as those used in New York City.

Marshfield, Ore.—William Wade and Thomas Goodale, of Marshfield, Ore., have formed a partnership to start an auto 'bus line between that city and Roseburg, a distance of 65 miles. They have purchased three eight-passenger Thomas cars, which will be put into service at once.

Hartford, Conn.—A taxicab line will be inaugurated by R. D. & C. O. Britton, local Maxwell agents. Four-cylinder Maxwell chasses will be used for the purpose. At present there is nothing of this sort in service, though several liverymen have done a good trade in motoring livery.

Pittsburg.—Application will shortly be made for a charter for a new concern, to be known as the Pittsburg Taxicab Company, which is to run a general taxicab business. Weil. & Thorpe are the solicitors.

Allentown, Pa.—Arthur A. Barber is to go into the auto livery business the first of the year. He has prepared to make his headquarters with the Berwin Automobile Company on North Eighth street.

Los Angeles, Cal.—The Needles-Parker Transportation Company has establishel an auto 'bus line between Needles and Parker, which will maintain a regular schedule in conjunction with the Santa Fe Railway.

Wilkes-Barre, Pa.—The Scranton Automobile Company will install a taxicab service in Wilkes-Barre beginning January 1, a satisfactory arrangement having been made with the Posten Transfer Company.

New Bedford, Mass.—A taxicab service will be established on January 1, using the same cab and taximeter now used in Boston, the charges for the services being similar.

Philadelphia.—Application is to be made for a charter for a new company, to be known as the Theobald Motor Car Company, which will deal in motor cars and accessories.

RECENT INCORPORATIONS.

The Northern Motor Car Company, Detroit, Mich., has filed articles at Lansing decreasing its capital stock from $500,000 to $1,000. The Northern Motor Car Company has been practically dissolved since the consolidation with the E.-M.-F. Company, but the nominal capital will keep the concern in existence until all debts are paid.

Winchester Automobile Company Winchester, Mass., capital stock $10,000, and will do a general automobile business. Incorporators: C. E. Tedford, of Boston, who is president, and George O. Fogg, of Winchester, treasurer.

Manhattan and Essex Auto Express Company, Newark, N. J., capital stock $100,000, and will do a general transportation business. Incorporators: O. M. Jackson, C. M. Hammell, Newark, and V. S. Richardson, of East Orange.

Worthington Clark Automobile Company, Fond du Lac, Wis., capital $20,000. Those interested are G. W. Worthington, E. N. Clark, George W. Stanchfield and others.

The Tourist Auto Car Company, Niagara Falls, N. Y., capital stock $10,000, and will operate and rent automobiles. Incorporators: J. H. Bridges, E. N. Wheeler and S. C. Fagard.

New Haven Taxicab Company, New Haven, Conn.—Capital stock, $25,000. George G., Peter C. and Robert G. Nesbit.

NEW INCORPORATIONS.

Savoy Auto and Taximeter Cab Company, Far Rockaway, N. Y., to run a taxicab service in the Rockaways. The incorporators and officers are: President, M. Katz; vice-president, L. T. Walter, Jr.; secretary, R. S. Smith; treasurer, F. Fitter, Jr.

Nightingale Whistle Manufacturing Company, New York City.—Capital stock, $1,000. Will manufacture whistles for automobiles and motors, tire inflaters, air compressors, etc. Incorporators: G. Stoddard, E. L. Keer and E. H. Carpenter.

Kennedy Ideal Carbureter Company, Boston.—Capital stock, $25,000. Will do a general automobile business. Incorporators: J. C. Kennedy, of Newton, who is the president, and W. E. Spear, of Boston, treasurer.

Marathon Automobile and Garage Company, New York City.—Capital stock, $1,000. Will do a garage and storage business. Incorporators: R. G. Berille, W. C. Wyckoff and P. G. Chedbum.

American Motor Cycle Company, Chicago, capital stock $15,000, will manufacture and deal in motorcycles and automobiles. Incorporators: W. H. Hess and A. J. Musselman.

Model Automobile and Garage Company, Belleville, Ill., capital stock $2,000, to operate a garage and manufacture autos and accessories. Incorporators: Joseph and E. L. Schwarz.

Dillard Delivery Company, Brooklyn, N. Y.—Capital stock, $2,000. Will manufacture wagons, carriages and automobiles. Incorporators: J. A. Dillard, H. B. Lyons and O. F. Fix.

Scientific Research Company, New York City.—Capital stock, $100,000. Will manufacture automobiles, motor boats, etc. Incorporators: A. E. Ranney, A. M. Day and A. J. Robinson.

Summit Motor Car Company, Summit, N. J., capital $5,000, to manufacture automobiles, bicycles and supplies. H. H. Day, Harry Baldwin and Rosalie Nelson are the incorporators.

Lake Avenue Auto Company, Cleveland, to do a garage and jobbing business. President, James Fleming; vice-president, John C. McLean; secretary, Albert Redmond.

Juruick Auto Company, Brooklyn, N. Y., capital stock, $5,000. Will manufacture automobiles, etc. Incorporators: M. F. Juruick, L. R. Smith and Anne Juruick.

Carl Klemp Company, Chicago.—Capital stock, $2,100. Will manufacture automobiles and accessories. Incorporators: Carl Klemp, H. T. Kett and T. E. Rooney.

Vanguard Mfg. Company, Joliet, Ill.—Capital $25,000, will manufacture automobiles and accessories. Incorporators: C. F. Jensen, C. N. Steinhart and N. L. Hurd.

Overland Automobile Sales Company, Oklahoma City, capital $10,000. Incorporators: Jerome Harrington, Will G. Brown and Alta E. Funk.

Cory Motor Car Company, Oklahoma City, capital $25,000. Incorporators: C. P. Cory, C. D. Crouch, W. E. Crouch and W. L. Peck.

Western Reserve Motor Car Company, Cleveland, capital $50,000. John H. Price is interested.

Automobile Motor Boat Company, Jefferson, O., capital $10,000.